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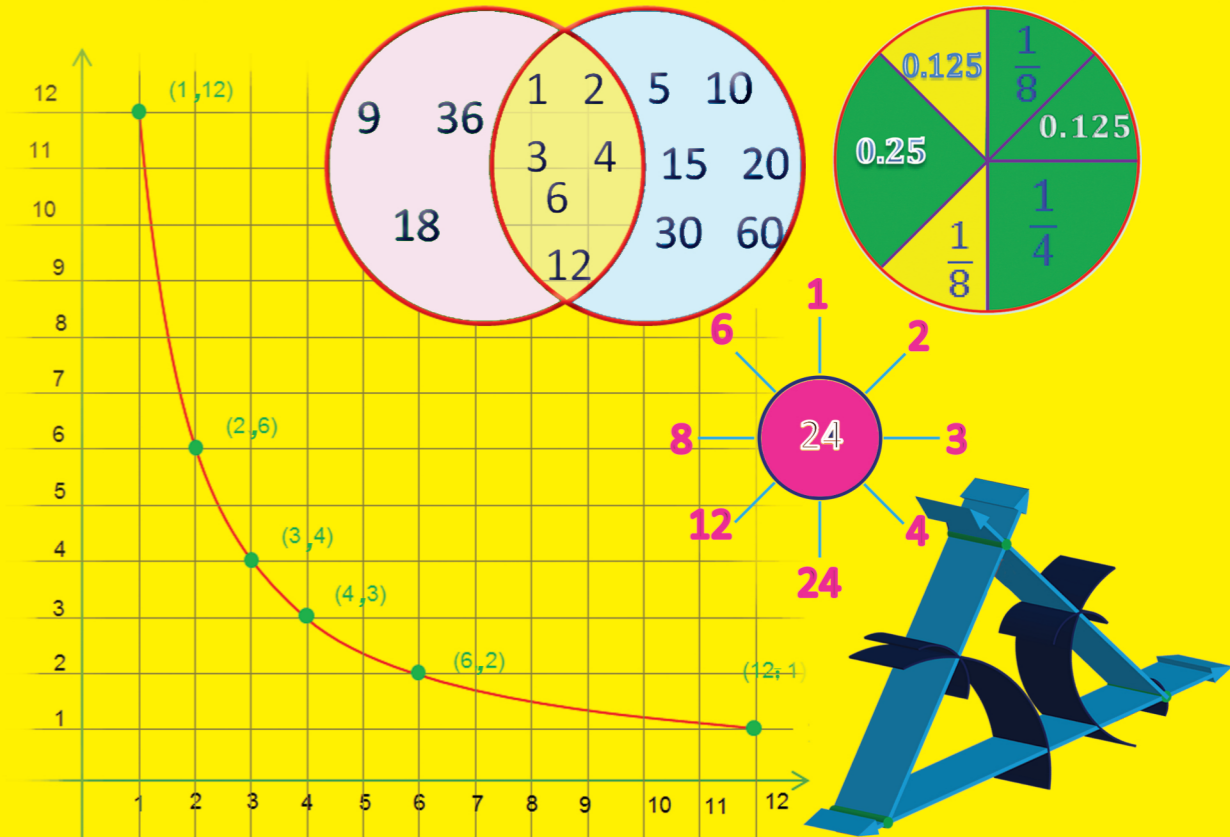
BUUGGA ARDAYGA
Fasalka 6^{aad}



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JAMHURIYADA DIMOQRAADIGA FADARAALKA ITOOBIYA
WASAARADDA WAXBARASHADA

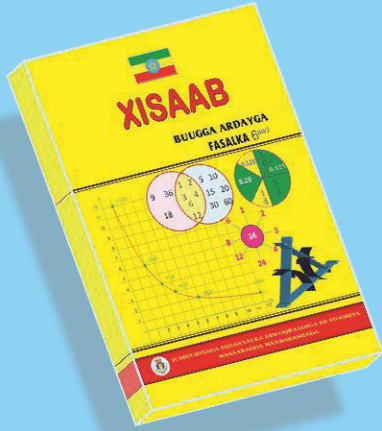
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JAMHURIYADA DIMOQRAADIGA FADARAALKA ITOOBIYA
WASAARADDA WAXBARASHADA

Birr 68.00

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BUUGGA ARDAYGA

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Wasaaradda waxbarashadu waxay u mahad naqaysaa shakhsiyaadka iyo kooxaha si toos ah iyo si dadban uga qayb galay daabicista iyo soo bixitaanka buuggan.

Kuwa haysta ogolaashaha qoraalka lookiin lagu eedeeyo inay gaf ka galeen xuquuqda buugga. Waa in ay la xidhiidhaan xafiis waynaha wasaaradda Waxbarashada ee ku taala Arata kiilo. Adiss Ababa Itoobiya.

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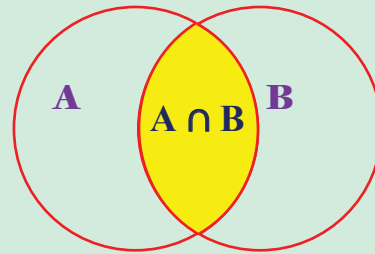
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CUTUBKA 1aad



FIKRADAHAAAS AASKA U AH' URURADA

Natiijada Cutubka:

Cutubkan dabadii, ardaydu waxay awoodi doonaan;

- *in ay fahmaan fikraddaha ururada*
- *in ay cadeeyaan iyo gartaan' xidhiidhka ka dhaxeeya ururada*
- *in ay kaga shaqeeyaan ururada labo xisaab falo (dhextaalka iyo isutagga).*

Tusmooyinka ugu muhiimsan:

1.1 Hordhaca ururada

1.2 Xidhiidhka ka dhexeeya ururada

1.3 Xisaab falada ururada

Hubin

Soo koobid

Layliska nakhtiinka ah

HORDHACA

Marwalba waxaynu ka hadalnaa “ururo”noocyo kala duwan leh oo laxidhiidha nolol maalmeedkeena. Tusaale, markii aynu ka hadleyno ardayda fasalka gudhihiisa kooxaha kubadda, kooxda idaha iyo riyaha banaanka jooga, raxan shinbiro ah oo geed dushii saaran, ama marwalba markii aan wax walba oo urursan kahadlayno.

Cutubka gudhihiisa waxaa lagugu fahansiin doonaa fikirada ururada ugu muhiimsan iyo isticmaalidda tuducyada iyo calaamadaha ururada, dhanka kale waxaad baran xidhiidhka kadhaxeeya qaar ka mid ah ururada iyo xisaab falada ururada aas’ aaska u ah oo ah dhextaalka iyo isutagga, muujinta iyada oo la adeegsanayo jaantusyada feen, iyo waxyaalaha loo adeegsado ururada.

1.1 HORDHACA URURADA

Cutub yaraha 1.1, waxaad ku baran doontaa fikirada ugu muhiimsan ee ururka; macnaha ururka, kutirsanaha ama xubinka ururka, ururka kooban, ururka ma koobanaha ah iyo ururka madhan. Waxaad kaloo baran doontaa qaar ka mid ah tidicyada iyo calaamadaha la xidhiidha ururada iyo sida saxda ah ee loo isticmaalo.

1.1.1 Qeexid Ururka

Hawlgalka 1.1

U fiirso sawiradan soo socda



Jaantuska 1.1

- 1 Waa sidee sida aad u qeexi sawir walba?
- 2 Waa maxay waxa aad ku aragto garoonka kubadda dhexdiisa?
- 3 Waa kee kooxda ugu xubno badan?

Nololmaal meedkeena dhexdeeda waxaan ku baranaa ururo kala duwan.

Qeexid 1.1: Ururku waa shey'yo si hufan (quman) oo qeexan u uruursan. Sheyga ku jira ururka waxaa loogu yeedhaa xubin ama ku tiirsanayaasha ururka.

Tusaale 1:

- ◆ Ururka gabdhaha ee fasalka
- ◆ Ururka ardayda ee dugsiga
- ◆ Ururka beeraleyda ee dagmo
- ◆ Ururka shaqaalaha ee warshada.

Shaqo Kooxeedka 1.1

- 1** Muuji ku tiirsanayaasha ururada soo socda.
 - b** Ururka wiilasha ee fasalkaaga
 - t** Ururka gabdhaha xidhan kabaha madaw ee fasalkaaga.
 - j** Ururka ardayda fir-fircoon ee fasalkaaga.
 - x** Ururka tirooyinka tirsiimo ee ka yar 10.
 - kh** Ururka qaar ka mid ah tirooyinka tirsiimo.
- 2** Intaad isu qeybisaan labo kooxood isbar-bardhiga jawaabihiina aad siiseen su'aasha sare ee 1.
 - b** Ma jireen wax kala duwanaansho ah jawaabihiina? Hadey tahay haa, ka dooda sababta kala duwanaashaha.
 - t** Kala saar ururada sida hufan u qeexan iyo kuwa aan ahayn.
- 3** Qor afar tusaalooyin oo ka mid ah kooxaha sheeyada laga helo agagaarka dugsigaaga ama gurigaaga.

Marka aan dhahno ururku si hufan ama habsan ayuu u qeexan yahay waxaan uga jeedna in ay surtagal tahay in aan shaki la'aan u muujino (cadayno) in shay lagu siiyay uu ururka ka tirsan yahay iyo in kale.

Calaamada ururka

Tidica, { }, waxaa loo isticmaalaa si aan u tusno ururka.

Ururada badanaa waxaa lagu asteeyaa xarfaha waaweyn sida A, B, C, iyo wixii la mid ah.

Bal aan eegno ururka tirooyinka tirsiimo ee ka hooseeya 5.

Waa maxay ku tiirsanayaasha ururkan? Haddii aan ururka ku asteyno A: kadib

$A = \{1, 2, 3, 4\}$. Ku tiirsanayaasha waxaa lagu kala soocay hakad (,).

Xaqiiqada 1 in uu yahay ku tiirsanaha ururka A waxaa lagugu tusi karaa sidan: $1 \in A$.

Ma garanaysaa waxa calaamadda \in ay u taagan tahay?

Calaamada \in waa xaraf Giriik ah, halkan waxaynu ku isticmaalnaa si aynu u tusno xubinimada. $1 \in A$ waxaa loo akhrin sida 1 waa xubin ka mid ah ururka A ama 1 waa ku tiirsanaha A.

Waxaad kaloo u qori kartaa: $2 \in A$ si aad u tidhaahdo 2 waa xubin ka mid ah ururka A. 5 ma xubin ka mid ah baa ururka A? Waxaa cad 5 in ayna xubin ka ahayn ururka A, waxaynu u qori karnaa $5 \notin A$, si aynu u dhahno 5 ma'aha xubin ka mida ururka A. Sidaa awgeed, \in waa calaamad xubinimada \notin na waa calaamadda xubin ma'ahaanta..

Tusaale 2: Aan qaadano ururkan D ee soo socda, xubnihiisana ay yihiin ururka tirooyinka tirsiiimo ee u dhaxeeya 3 iyo 9.

$$D = \{4, 5, 6, 7, 8\}.$$

Ururka D wuxuu leeyahay shan xubnood. Waxaa loo qori karaa sida $n(D) = 5$, kaas oo loo akhriyo sida tirada ku tiirsanayaasha ururka D waa 5.

Laylis 1.1

- 1 Kuwan soo socota kooxdee baa si hufan u qeexan? Sabab?
 - b Tirooyinka Kisi ee ka hooseeya 9.
 - t Shinbiraha qurxoon ee laga helo wabi shabeele hareerihisa.
 - j Kooxda gabdhaha qurxoon ee fasalka dhexdiisa.
 - x Kooxda xayawaanaadka duurjoogta ee Itoobiya dhexdeeda.
- 2 Weedhahan soo socda sideen ugu qori karnaa inaga oo isticmaaleyna calaamadaha xisaabta?
 - b Y waa kutiirsanaha ururka S.
 - t Y ma'aha kutiirsanaha ururka S.

- 3** Go'aanso in aad ku qori karto calaamada \in lamaanayaasha dhexdooda iyo in kale.
- | | | | |
|----------|---------------------|----------|---------------------------------|
| b | 6.... {1, 2, 3, 5} | j | 7.... Ururka tirooyinka mutaxan |
| t | 24.... {2, 4, 6, 8} | x | 5.... {1, 2, 3, ..., 8} |
- 4** Qor tirada kutiirsanayaasha ururadan soo socda.
- b** Ururka tirooyinka idil ee ka yar 4.
- t** $F = \{a, e, i, o, u\}$
- j** Ururka xayawaanaadka afar lugoodlaha laga helo gurigaaga.
- 5** Fiiri ururka B ee soo socda kaas oo natusaya ururka orodyahanada raga ee 10,000 ee metir kuwaas oo ka qaday billad dahabka olombiga caalamka. Magacdooda waxaa lagugu siiyay ururka
- $B = \{\text{Mirus, Hayle, Qananisa}\}$
- b** Waa maxay kutiirsanayaasha ururka B?
- t** Ma run baa in magaca Mirus uu yahay $\in B$?
- j** Ma runbaa in magaca dharaartu ay tahay $\in B$?

Urur Madhan

Hawlgalka 1.2

Fiiri ururadan soo socda qor kutiirsanayaasha ururka.

- b** Ururka tirooyinka tirsiiimo ee ka yar 3.
- t** Ururka ardayda fasalkaaga ee da'doodu tahay 12 sano.
- j** Ururka ardayda fasalkaaga ee da'doodu tahay 100 sano.
- x** Ururka xayawaanka afar lugoodlaha gurigiina dhexdiisa.

Markii aad ka jawaabtid su'aalaha sare waxaa laga yaabaa in aad ku aragtid ururo aan lahayn wax kutiirsanayaal ah. Ururada noocaa ah waxaa lagu qeexaa sidan soo socota.

Qeexid 1.2: Ururka aan lahayn wax kutirsanayaal ah ama xubno ah waxaa loogu yeedhaa urur madhan. Ururka madhan waxaa lagu calaamadiyaa $\{ \}$ ama \emptyset .

Tusaale 3: Ururadan soo socda waxay tusaale u yihiin ururada madhan.

- ◆ Ururka ardayda ee galaaskaada dhererkooduna yihiin 4 metir.
- ◆ Ururka ardayda fasalkaada ee da'doodu tahay 100 sano.
- ◆ Ururka dadka ee duuli kara.
- ◆ Ururka leydiga kuwaas oo ah gobo.

Shaqo Kooxeed 1.2

Kuwan soo socda kuweebaa ah ururo madhan? Kala dood asaxaabtaada ku agjooga.

- b** B = ururka caruurta fasalkaaga kuwaas oo leh saddex lugood.
- t** T = ururka tirooyinka mutuxan ee dhaban.
- j** J = ururka fardaha duuli kara
- x** X = Ururka qoraxda, dayax, dhulka
- kh** KH = Ururka leydiga ee ah goobooyinka.

Ururada kooban iyo kuwa ma koobanaha

Hawlgalka 1.3

Imisa ku tiirsanayaal ayay leeyihiin ururadan?

- b** $\{a,e,i,o,u\}$
- t** Ururka tirooyinka idil ee dhaban ee ka yar 10
- j** Ururka tirooyinka idil ee Kisi ee ka yar 10.
- x** Ururka tirooyinka idil.

Qeexid 1.3: Ururka kooban waa ururka leh kutirsanayaal xadidan ama tiro xubno cayiman. Ururka ma koobnaha ah waa ururka leh tiro ku tiirsanayaal ah oo aan xadlahayn.

Tusaale 4:

- b** $B = \{0, 1, 2, 3, \dots, 9\}$ waa urur kooban; wuxuu leeyahay 10 xubnood, taas oo ah, $n(B) = 10$.
- t** $T = \{\text{tirooyinka tirsiiimo ee u dhaxeeya 2 iyo 15}\}$ waa urur kooban (cayiman); ururka T wuxuu leeyahay 12 xubnood, taas oo ah, $n(T) = 12$.
- j** $J = \emptyset$ waa urur kooban (cayiman); ururka J ma laha wax xubin ah, taas oo ah, $n(J) = 0$.
- x** Ururka dhammaan tirooyinka tirsiiimo waa urur ma koobane ah
- kh** Ururka jajabka waa urur makoobna ah.

Laylis 1.2

- Ka bixi afar tusaalooyin oo qeexaya ururka madhan.
- Calaamadahan soo socda kuweebaa u taagan ururka madhan?
b \emptyset **t** $\{\}$ **j** $\{\emptyset\}$ **x** $\{0\}$ **kh** 0
- Imisa xubnood ayay leeyihiin ururadan soo socda?
b $A = \{0\}$ **t** $B = \{1, 2\}$ **j** $C = \{0, 1, 2\}$
x $D = \{0, 1, 2, 3\}$ **kh** $E = \emptyset$
- Fiiri ururka B iyo T ee su'aasha 3 ma yahay $n(A) = n(T)$? Sabab?
- Sidan soo socota ururadee baa ah kuwa kooban iyo kuwa makoobnaha ah?
b Ururka ardayda ee fasalkaada.
t Ururka tirooyinka tirsiiimo ee ka badan 20.
j Ururka gawaadhida caalamka ee 2002T.E.
x Ururka dhibcaha xariiqo googo'an.
kh Ururka tirooyinka dhaban ee tirsiiimo ee u dhaxeeya 2 iyo 4.
r Ururka jajabka ee u dhaxeeya 1 iyo 2.
- Ka soo qaad $B = \{0, 1, 2, 3, \dots\}$.
 $T =$ Ururka tirooyinka dhaban ee tirsiiimo ee u dhaxeeya 30 iyo 40
 $J =$ Ururka tirooyinka tirsiiimo ee ka yar 30 una qeybsama 5 markaa raadi:
b $n(B)$ **t** $n(T)$ **j** $n(J)$

1.2 XIDHIIDHKA Ka DHAXEEYA URURADA

Cutub yarahan dhexdiisa waxaad ku baran doontaa xidhiidhyada ka dhaxeeya labo ururo, hormo ururo, hormo urur quman, ururo isudhigma iyo oruro sle'eg.

1.2.1 Hormo Urur iyo Hormo Urur Quman

Hawlgal 1.4

Bal aan eegno ururada B iyo T ee lagugu siiyay hoos.

$$B = \{a, b, 1, 3, 4\} \text{ iyo } T = \{b, 1, 3\}$$

Isbarbardhig kutirsanayaasha ururka B iyo kutirsanayaasha ururka T.

Waa maxay xidhiidhka aad ku aragtid ee ka dhaxeeya labada urur?

Ka soo qaad $B = \{a, b, c, d, e\}$ iyo $T = \{a, c, d\}$.

Halkan waxaad ku aragtaa xubin walba oo ururka T ah in uu yahay ururka B. tusaalahan dhexdiisa, ururka T waxaa la odhan hormo urur ayuu u yahay ururka B.

Si guud sidan soo socota ayaa lagu qeexi.

Qeexid 1.4: Haddii B iyo T ay yihiin ururo oo isla markaana kutirsane kasta oo ururka B ku jiraa uu ku jiro ururka T markaa waxaan dhahaynaa ururka B hormo urur ayay u tahay ururka T. Xidhiidhkan waxaa lagu asteeyaa $B \subseteq T$, waxa loo akhriyaa B waxay hormo urur u tohay T.

Inaga oo ka duulayna qeexidda 1.4, waxaa la socda hadey jirto hal ku tiirsanaha B oon ahayn ku tiirsanaha ururka T, kadib B uma aha hormo urur T (waxaana loo qori $B \not\subseteq T$). xusuusnaw, ururka madhan wuxuu hormo urur u yahay urur kasta iyo ururka B wuxuu hormo urur u yahay isaga qudhigiisa.

Taas oo ah, haddii B ay tahay urur walba, kadib $\emptyset \subseteq B$ iyo $B \subseteq B$.

Shaqa kooxeedka 1.3

1 Intaad rogatid kadibna buuxi meelaha madhan

| Urur | Tirada ku tiirsanaha (n) | Hormo urur | Tirada hormo urur |
|-------------|--------------------------|---|-------------------|
| \emptyset | 0 | \emptyset | _____ |
| {a} | 1 | $\emptyset, \{a\}$ | 2 |
| {a, b} | 2 | _____ | _____ |
| {a, b, c} | _____ | $\emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}$ | _____ |

2 Si taxadar leh ugu fiirso tirada hormo ururada ee ku yaala shaxda aad buuxisay.

- b** Maxaad ku aragtay qoyska natusinaya tirada hormo ururada iyo qoyska na tusinaya tirada kutirsanayaasha (n)?
- t** Adoo adeegsanaya xidhiidhka kor laga helay, waa imisa hormo urur ayuu leeyahay ururka {a, b, c, d} ee leh 4 xubnood.
- j** Imisa hormo urur ayuu leeyahay ururka {a, b, c, d, e} ee leh 5 xubnood?

3 Ma qori kartaa qaaciidada u leeyahay tirada hormo ururada ee ururka ee leh xubnaha n?

Tusaale 1: Fiiri ururada M, N, iyo Q ee hoos ku xusan.

$$M = \{2, 3, c, e, 4\}; N = \{2, 3, 4, a, d, 5\}; Q = \{1, 2, 3, c, 4, e, r\}$$

$M \not\subseteq N$, sababtoo ah $C \in M$ laakiin $C \notin N$, $M \subseteq Q$ sababtoo ah dhammaan xubnaha M waxay sidoo kale xubno u yihiin Q.

Hawlgalka 1.5

Si taxadar leh u eeg labadan ururo A iyo B ee hoos lagu siiyay.

$$A = \{w, x, y, 12, 16\} \quad B = \{y, z, 12, 16, w, x\}$$

- b** Ururka A ma u yahay hormo urur ururka B? B hormo urur ma u yahay A? sabab?
- t** Imisa xubnood ayuu leeyahay urur kasta?
- j** Waa kee ururka ugu xubno badan, ma A mise B?

Inaga oo ka anbaqaadeyna hawlgalada kor ku xusan, waxaad ogaan kartaa A in ay u tahay hormo urur B, laakiin B ayna u ahayn hormo urur A. dabecadaha sida ah waxaa lagu qeexi karaa sidan soo socota:

Qeexidda 1.5: Hadey A iyo B ay yihiin ururo oy A hormo urur u tahay B, laakiin B aynan hormo urur u ahayn A, kadib A waxaa ladhihi karaa hormo quman ayay u tahay B. waxaa lagu asteeyaa $A \subset B$ loona akhriyaa “A waxay hormo quman u tahay B”.

Tusaale 2: **b** Hadey $A = \{1, 2, 3, 4, 5\}$ iyo $B = \{3, 4\}$, kadib $B \subset A$ sababtoo ah $B \subseteq A$, laakiin $A \not\subseteq B$.

t Ka soo qaad $R = \{1, 2, 4, 8, a, b, c\}$ iyo $S = \{4, 2, 1, a, 8, b, c\}$, kadib $R \not\subseteq S$. maadaama $R \subseteq S$ iyo waliba $S \subseteq R$.

Laylis 1.3

1 J iyo X waa ururo sida hoos ku xusan

$J = \{\triangle, \diamond, +\}$, $X = \{\diamond, \square, +, \square, \Delta\}$ ururka J ma u yahay hormo urur X?

2 Hoos waxaa lagugu siiyay ururka maalmaha todobaadka;

(Axad, Isniin, Talaado, Arbaco, Khamiis, Jimce, Sabti)

Qor hormo ururada maalmaha todobaadka ee

b Ka bilawda xarafka A.

t Ku dhammaada xarafka I.

j Ka bilawda xarafka K.

x Ka bilawda xarafka J.

3 Ka samee saddex hormo urur ururkan $\{a, b, c, d\}$.

4 Ka samee hal hormo urur mid walba oo ka mid ah ururadan soo socda.

b Ururka ardayda ee galaaskaaga.

t $R = \{w, x, y\}$.

j Ururka tirooyinka tirsiiimo ee ka yar 10.

5 Tax dhammaan hormo ururada ka suurtagalay ururadan soo socda.

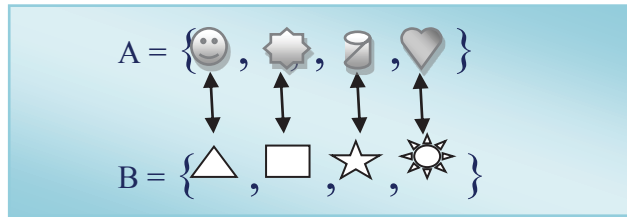
b $A = \{1, 2, 3\}$

t $B = \{5, 9\}$

- 6** Hadey $A = \{2, K, 4, n, 5\}$, qor labo hormooyinka quman ee A.
- 7** Go'aami ururada K iyo L dhexdooda in lagu qori karo calaamadaha \subset ama K.
- b** $K = \{x \in \mathbb{N} : x \text{ waa tiro mutaxan}\}$; $L = \{2, 3, 5, 7\}$ kadib, K _____ L.
- t** $K = \{c, m, n, o, p\}$; $L = \{l, o, p, m\}$, kadib, L ___ K.
- j** $K = \{t, a, c, t, i, c\}$; $L = \{c, a, t\}$, kadib, L _____ K.
- x** $K = \{x \in \mathbb{N} : x \text{ waxay ka yar tahay } 20\}$;
 $L = \{x \in \mathbb{N} : x \text{ waxay ka yartahay } 10\}$ kadib, L _____ K.
- 8** Ma u yahay ururka ardayda ee fasalkaagu hormo quman marka loo eego ururka ardayda ee dugsigaaga? Sharaxaad ka bixi. Ma u yahay ururka gabdhaha ee fasalkaagu hormo quman marka loo eego ururka ardayda ee dugsigaaga? Sharaxaad ka bixi.

1.2.2 Isudhignaanta iyo Isle'ekaanshaha Ururada

Si taxadar leh u eeg labada ururo A iyo B ee lagugu siiyay hoos



Jaantuska 1.2

Labada ururo A iyo B ma'aha kuwo isle'eg sababtoo ah waxay leeyihiin xubno kala duwan laakiin ururka A iyo B waxay wadaagaan dabeecado. Haddi aan isbarbardhigno Labada ururo, wey isudhigmaan, kadibna waxay noqdaan hal-la-hal.

Hadda bal eeg ururadan C iyo D ee jaantuska 1.3. ma yihiin ururadan C iyo D kuwo isu noqdo hal-la-hal? Hal xubin oo ururka C ayaa baaqi noqday. Sidaa darteed, waxaad arki kartaa ururada C iyo D in ayna iskugu beegnayn mid-mid.



Jaantuska 1.3

Ururada sida A iyo B ee lagu siiyay jaantuska 1.2 ee isugu began mid-mid waxaa loogu yeedhaa ururada isku dhigma.

Qeexidda 1.6: Haddii labo urur A iyo B ay isugu began yihiin mid-mid kolkaa A iyo B waa ururo isu dhigma. Waxaana lagu asteeyaa $A \leftrightarrow B$ iyo loo akhriyaa ururka A waxuu u dhigmaa ururka B.

Tusaale 3: i Fiiri ururada x iyo y ee lagu siiyay hoos.

$x = \{1, 2, 4, a, b, c\}$ iyo $y = \{a, 6, 10, 12, b\}$ ururada x iyo y ma aha kuwo isku dhigma; sababtoo ah isuguma aadano hal-laa-hal.

ii Hadda bal eeg ururada R iyo S ee lagu siiyay hoos

$R = \{2, 4, 6, 8, 10, 12\}$ iyo $S = (R \leftrightarrow S)$, sababtoo ah waxay isugu aadi karaan hal-ilaa-hal.

Hawlgalka 1.6

Si taxadar leh u eeg ururada M iyo N ee lagu siiyay hoos.

$$M = \{1, 3, 7, 8, 9\}; N = \{3, 7, 1, 9, 8\}$$

b Ururka M ma u dhigma ururka N ? Sabab?

t Ururka M hormo urur ma u yahay N ?

j Ururka N hormo urur ma u yahay M ?

Qeexidda 1.7: Haddii A iyo B ay yihiin ururo oo xubin walba oo ururka A ah laga helo ururka B , iyo xubin walba oo ururka B ahna laga helo ururka A , A iyo B waxaa loogu yeedhaa ururo isle'eg. Waxaana lagu asteeyaa $A = B$ waxaana loo akhriyaa ururka A wuxuu le'eg yahay ururka B .

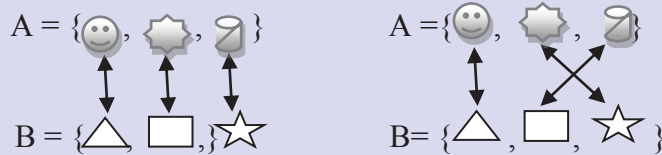
Si ay ururada A iyo B ay u noqdaan kuwo isle'eg, A waa in ay hormo urur u noqoto B , B na waa in ay hormo urur u noqoto A . taas oo ah, hadey $A \subseteq B$ dabadeedna $B \subseteq A$ kolkaa $A = B$.

Tusaale 4: Hadey $A = \{x: x \text{ ay tahay tiro tirsiiimo oo ka yar } 7\}$ iyo

$$B = \{1, 2, 3, 4, 5, 6\}, \text{ dabadeedna } A = B.$$

Laylis 1.4

1 Ururada waxaa la isugu aadin karaa wadooyin badan. Jaantuska 1.4 wuxuu natusinayaa labo wado oo la isugu aadiyo ururada isku began. Natusi labo wado oo dheeraad ah oo la isugu aadiyo labadan ururo.



Jaantuska 1.4

2 Hoos waxaa ah afar ururo;

$A = \{a, b, c\}$

$B = \{1, 2, 3\}$

$C = \{\text{smiley}, \text{star}, \text{glass}\}$

$D = \{\text{smiley}, \text{star}, \text{glass}, \text{book}\}$

Waa ururadee kuwa isle'eg?

3 Samee labo urur oo ku beegma ururka (buug, qalin qori, tirtire).

4 Qor lix hormo urur u ah ururka $\{p, q, r, s\}$ kuwaas oo u dhigma ururka $\{1, 2\}$.

5 Lamaanayaashan ururo ee soo socda kuwee baa isugu aadi kara mid-mid? Tus sida ay u suurtagali karto inay isugu aadaan mid-mid.

b $x =$ ururka dhaban ee tirooyinka tirsiiimo ee ka yar 10.

$y =$ {ururka dhaban ee tirooyinka tirsiiimo ee ka badan 10 laakiin ka yar 20}.

t $P =$ {ururka ardayda ee fasalkaada}

$Q =$ {ururka sanadka ardayda fasalkaada}.

6 Sidan soo socota ururadee baa isle'eg? Sabab u yeel.

$A = \{0, 2, 4, 6, 8\}$; $B =$ ururka dhaban ee tirooyinka tirsiiimo ee ka yar 10

$C = \{4, 8, 0, 6, 2\}$; $D = \{4, 8, 6, 2\}$

$E = \{2, 2, 2, 4, 6, 8\}$; $F = \{2, 4, 8, 6\}$.

7 Ka soo qaad $A = \{1, 3, 5, 7, 9\}$ iyo $B =$ ururka Kisi ee tirooyinka tirsiiimo ee ka yar 10. Ma tahay $A = B$? Sabab?

1.3 XISAAB FALADA URURADA

Xisaabaadka artimeetikada, waxaad haysataa xisaab falada aasaaska ah sida isugeynta kalagoynta, iskudhufashada iyo isuqaybinta. Xisaab fal kasta waxay ku siin tiro sadaxaad markii labo tiro walba la isu xisaabfalo. Sidoo kale, waxaa jira xisaab falo dhexmara ururada kuwaas oo nasiinaya urur sadaxaad markii la isuxisaabfalo labo urur oo kasta. Cutub yarahan dhexdiisa waxaynu ku baraneynaa labo xisaab falada ururada oo muhiim ah looguna yeedho dhextaal iyo isutag. laakiin intaadan bilaabin wax ku saabsan xisaab falada ururkan bal aan dib isuxusuusino labo siyaabood oo la isugu geeyo tirooyinka.

Xisaabfaladda isugeynta iyo isku dhufashada ee tirooyinka marka laga shaqaynayo waad ogtihiin in markiiba laba tiro oo qudh ah inta la qaato la isugeeyo ama la iskudhufto.

Matalan si aan uhelno wadarta $2 + 3 + 4$ waxa surta gal inaan horta isugeeyno $2 + 3$ si aan u helno wadarta 5.

Kadibna waxaan isugaynaynaa $5 + 4$ si aan u helno 9 oo ah dhamaan wadarta loo baahanyahay.

Hawsha iskudhufashadu na waa la mid oo markiiba laba tiro oo qudhaata ayaa la isku dhuftaa. Sidoo kale markaan ku shaqaynayno xisaabfaladda. Saddax urur markiiba laba urur oo qudhaata ayaan qaadanaynaa oo aan xisaabineynaa.

Waxa jira xeer kale oo tirooyinka muhiim u ah. Waxaad ogsoontahay in wadarta laba tiro oo tirooyinka tirsiiimo ama taranka laba tiro ee tirooyinka tirsiiimo ay had iyo jeer yihiin tiro tirsiiima ah. Matalan $3 + 4 = 7$ sidoo kale $5 \times 8 = 40$. Xisaab yahanadu xeerkan waxay yidhaadaan xeerka oodnaanta. Isugeynta iyo iskudhufashada ee tirooyinka tirsiiimo way ogolyihiin xeerka oodnaanta.

Sidoo kale markaad xisaab fal ku samaysid laba urur natiijadu waa urur kale uun.

1.3.1 Dhextaalka Ururada

Hawlgalka 1.7

Fiiri labadan urur ee soo socda

$A = \{r, s, t, u, v\}$ iyo $B = \{a, r, b, s, c\}$.

Waa xubnahee kuwa laga leeyahay labada ururo A iyo B? Qor urur ka kooban xubnaha ay wadaagaan labaduba A iyo B.

Ururka ka kooban xubnaha ay wadaagaan ururada A iyo B waxaa loogu yeedhaa dhextaalka ururada A iyo B.

Qeexidda 1.8: Dhextaalka labo ururo A iyo B waa ururka dhammaan xubnihiisu ay wadaagaan ururada A iyo B. waxaa lagu asteeyaa $A \cap B$ loona akhriyaa “A dhextaalka B”.

U fiirso faraaqa u dhaxeeya “ururada xidhiidhkaleh” iyo “dhextaalka” labada urur. Sharaxaadadan soo socota ayaa kaa caawin doonta in aad fahantid faraaqa u dhaxeeya.

Halkan waxaa ah labo urur;

$$C = \{1, 2, 3\} \text{ iyo } D = \{2, 3, 4\}$$

Ururada C iyo D waxay leeyihiin xubno ay wadaagaan, magac ahaan 2 iyo 3. Ururada noocan ah waxay leeyihiin dhextaalka. Ururka ka sameysma iyada oo laqaadanayo xubnaha ay wadaagaan waxaa loogu yeedhaa dhextaalka. Tusaale, dhextaalka labada urur C iyo D waa ururka $\{2, 3\}$. Wadada gaaban ee loo qoro tan waa; $C \cap D = \{2, 3\}$. Calaamada \cap waxaa loo akhriyaa dhextaalka.

1.3.2 Isutaga ururada

Sida dhextaalka oo kale, waa xisaab falka ururada ee aasaasiga ah. Sida odhaahyada “Isutaga shaqaalaha” ama “isutaga ardayda; erayga midaw, waxaa loo adeegsadaa ururo, wuxuuna qeexayaa xisaabfalka isutaga.

Hawlgalka 1.8

Fiiri labadan urur ee soo socda;

$$A = \{\text{Cabdi, Cali, Khadar, Xasan}\}; B = \{\text{Hodan, Xamda, Xasan, Faadumo}\}$$

Qor ururada ka kooban dhammaan xubnaha laga leeyahay midkood A ama B, ama labaduba A iyo B.

Qeexidda 1.9: Isutagga labada ururo A iyo B waa dhammaan xubnaha ku jira A, ama ku jira B, ama ku jira labaduba A iyo B. waxaa lagu asteeyaa $A \cup B$ loo akhriyaa sida ‘A kudarsantay B’.

Isutagga labada ururo waa urur kale oo $A \cup B$ uu calaamad u yahay ururka ka sameysmay labada urur A iyo B.

- Tusaale 1:b** Hadey $A = \{1, 3, 5, 7\}$ iyo $B = \{2, 4, 6\}$,
kadib $A \cup B = \{1, 2, 3, 4, 5, 6, 7\}$.
- t** Hadey $C = \{a, b, c\}$ iyo $D = \{d, e, f, g\}$
kadib $C \cup D = \{a, b, c, d, e, f, g\}$.

Shaqo kooxeed 1.4

Ka soo qaad $A = \{3, 4, 5, 6\}$ iyo $B = \{5, 6, 7\}$.

- b** Imisa xubnood ayay leeyihiin urur kaste A iyo B?
- t** Imisa xubnood ayuu leeyahay ururka $A \cup B$?
- j** Ma u baahaneynaa in aan isudarno tirada u leeyahay urur kasta si aan u helno tirada xubnaha isutaga?

Hadda fiiri tusaalooyinkan soo socda;

Hadey $C = \{1, 3, 5, 9\}$ iyo $D = \{2, 4, 6, 8\}$,

kadib $C \cup D = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

Waxaad kaloo heli

$n(C) = 5$; $n(D) = 4$; $n(C \cup D) = 9$; $n(C) + n(D) = n(C \cup D) = 5 + 4 = 9$

Sidaa awgeed, $n(C \cup D) = n(C) + n(D)$

Tusaalahan dhexdiisa, markii labada urur ay yihiin kuwo aan wadaagin wax xubno ah waxaynu helnay tirada xubnaha isutaga in ay la mid tahay wadarta tirada xubnaha urur kasta.

Sida aanu ka arki karno shaqo kooxeedka 1.4 iyo tusaalaha sare, waxaanu odhan karnaa; tirada xubnaha isutaga labada ururo waxay la mid tahay wadarta tirada urur kasta hadey labada urur ayna lahayn waxkulana, haddii kale marwalba tira ahaan waxay isdhimi inta tirada xubnaha dhextaalka. Taasi macna ahaan labo urur oo walba A iyo B oo dhextaal leh:

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$

Tusaale 2:

- b** Ka soo qaad $A = \{2, 4, a, b, 6\}$ iyo $B = \{c, d, 2, r, 4\}$.
Kadib, $A \cup B = \{2, 4, a, b, 6, c, d, r\}$ iyo $(A \cap B) = \{2, 4\}$
 $n(A) = 5$; $n(B) = 5$; $n(A \cup B) = n(A) + n(B) - n(A \cap B) = 5 + 5 - 2 = 8$

- t** Hadey $A = \{\text{Cabdi, Cali, Axmed, Badri}\}$ $B = \{\text{Ubox, Sitra, Badri, Sahra}\}$
 $A \cup B = \{\text{Cabdi, Cali, Axmed, BAdri, Ubox, Sitra, Sahra}\}$
 $A \cap B = \{\text{Badri}\}$
 $n(A) = 4; n(B) = 4; n(A \cap B) = 1;$
 $n(A \cap B) = 7 = 8 - 1 = n(A) + n(B) - n(A \cap B)$

Laylis 1.5

- 1** Tax xubnaha dhextaalka ee ururadan lammaan.
 - b** $A = \{a, b, c, d, e\}; B = \{a, e, i, o, u\}$
 - t** $A = \{x \in \mathbb{N} : x \text{ aytahay tiro mutaxan oo ka yar } 10\};$
 $B = \{y \in \mathbb{N} : y \text{ aytahay tiro Kisi oo ka yar } 10\}$
 - j** $A = \{\text{bisad, lo', fardo, geel}\}; B = \{\text{libaax, shabeel, maroodi}\}$
- 2** Qor ururada ka dhasha dhextaalka ururadan soo socda.
 - b** haddi $B \subseteq T$; kadib $B \cap T = \underline{\hspace{2cm}}$ **t** $A \cap \emptyset = \underline{\hspace{2cm}}$
 - j** haddii $A \subset R$, kadib $A \cap R = \underline{\hspace{2cm}}$
- 3** Tax xubnaha isutaga ururada lamaanaha ah ee soo socda.
 - b** $A = \{a, b, c, d\}; B = \{b, d, e, f\}$
 - t** $X = \{2, 4, 6, 8, 10\}; Y = \{3, 6, 9, 12\}$
 - j** $P = \{2, 4, 6, 8, 10\}; Q = \{\Delta, \triangle, \square\}.$
- 4** Sidan soo socota buuxi ado tixraacaya ururada gudaha su'aasha (3) ee kore?
 - b** $n(A \cup B) = \underline{\hspace{2cm}}$ **t** $n(X \cup Y) = \underline{\hspace{2cm}}$ **j** $n(P \cup Q) = \underline{\hspace{2cm}}$
- 5** Hadey $X =$ ururka wiilasha ee galaaska fasalka 6^{aad}
 $Y =$ ururka wiilasha kubadda cagta ee fasalkaada 6^{aad}.
 Haddii $n(X) = 22, n(Y) = 9$ iyo $n(X \cap Y) = 4$, kadib raadi $n(X \cup Y)$.
- 6** Waxaa lagu siiyay $n(X) = a, n(Y) = b$, iyo $n(X \cap Y) = C$, qor xeerka guud ama qaacidada $n(X \cup Y)$.
- 7** Haddii $A = \{2, 4, 6, 8\}, B = \{1, 3, 5\}$, iyo $C = \{a, b, c, d\}$, kadib raadi
 - b** $A \cup B$ iyo $B \cup A$. Ma yahay $A \cup B = B \cup A$?
 - t** $(A \cup B) \cup C = A \cup (B \cup C)$. Ma yahay $(A \cup B) \cup C = A \cup (B \cup C)$?

1.3.3 Jaantuska feen

Cashiradii hore dhexdooda, waxaad ku soo baratay sida loogu isticmaalo tuducyada iyo xidhiidhada ka dhaxeeya ururada. Casharkan gudhiisa, waxaad ku baran doontaa sidii ururada, xidhiidhada ka dhaxeeya ururada loogu soo bandhigi lahaa iyada oo la adeegsanayo jaantuska feen (magacan wuxuu ka yimid nin filoosoofi biritishna ah oo la odhan jiray Joon Feen 1834 – 1923). Jaantuska feen dhexdiisa, ururada waxaa lagu soo bandhigay muuqaalo, badanaa gobo iyo muuqaalka ukunta. Ku tirsanayaasha ururka waxaa lagu habeeyay goobada dhexdeeda.

Tusaale 3: waxaa lagu siiyay ururka P oo tirooyinka kisi ee u dhaxeeya 9 iyo 19, sawir oo ku habee jaantuska feen si aad u bandhigid ururka P oo, tus dhammaan ku tirsanayaasha ururka P jaantuska feen dhexdiisa.

Furfuris: Tax xubnaha P.

$$P = \{11, 13, 15, 17\}. \text{ Xusuusnaw 'u dhaxeeya'}$$

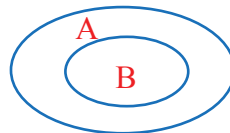
Kuma jiraan 9 iyo 19.

Sawir goobo ama muuqaal ukun wax leh. Ku habee P. kadhig xubnaha P sida lagugu tusay [sawirka 1.5](#).



Jaantuska 1.5

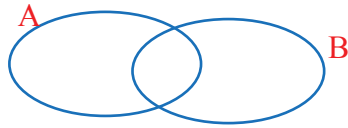
Waxaa jira wadooyin badan oo lagu cadeyn karo xidhiidhada ururada iyada oo la adeegsanayo jaantuska feen. Hadaad taqaantid, tusaale, taas dhammaan xubnaha B waa xubnaha A ama $A \cap B = B$ ama $A \cup B = A$, kadib waxaad sawiri kartaa B ku dhex jirta A sida lagugu tusay [jaantuska 1.6](#) dhexdiisa.



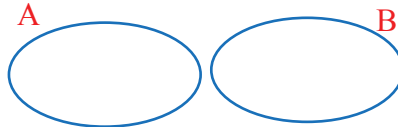
Jaantuska 1.6 ($B \subseteq A$)

Sidoo kale, waxaad sawiri kartaa A dhinaca kaga daahan B, hadaad taqaanid qaar ka mid ah xubnaha A waxay sidoo kale xubno u yihiin B ama $A \cap B \neq \emptyset$ ama

$n(A \cap B) \neq 0$. fiiri [jaantuska 1.7](#).

Jaantuska 1.7 ($A \cap B \neq \emptyset$)

Waxaad kaloo sawiri kartaa labo urur A iyo B oon lahayn wax kulan haddii aad aqoon u leedahay midda ah majiraan wax xubno oo A laga leeyahay B ama $A \cap B = \emptyset$ ($A \cap B = 0$). fiiri jaantuska 1.8.

Jaantuska 1.8 ($A \cap B = \emptyset$)

Tusaale 4: Sawir jaantuska feen si aad ugu soo bandhigtid xidhiidhka ka dhexeeya ururada:

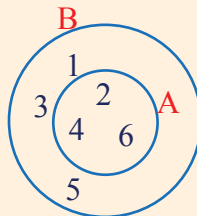
$$A = \{2, 4, 6\} \text{ iyo } B = \{1, 2, 3, 4, 5, 6\}.$$

Furfuris: (fiiri jaantuska 1.9)

Talaabada 1: sawir goobada A oo ku dhexjirta goobada B,

Talaabada 2: ku qor ku tiirsanayaasha gudaha goobada A.

Talaabada 3: ku qor xubnaha ku soo hadhay gudaha goobada B, ee ka baxsan A.



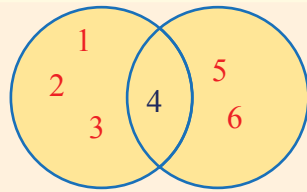
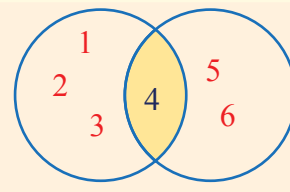
Jaantuska 1.9

Tusaaleyaashan soo socda, waxaad ku arki doontaa sidii aad ugu soo bandhigi lahayd ururada dhextaalka iyo isu tagga adoo adeegsanaya jaantuska feen.

Tusaale 5: b Haddii $A = \{1, 2, 3, 4\}$ iyo $B = \{4, 5, 6\}$,

$$\text{kadib } A \cup B = \{1, 2, 3, 4, 5, 6\} \text{ iyo } A \cap B = \{4\}$$

$A \cup B$ iyo $A \cap B$ waxaa lagu soo bandhigay qeybaha la hadheeyay ee jaantuska feenka soo socda kuna yaala jaantuska 1.10.

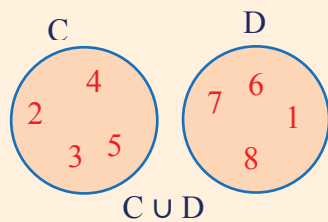
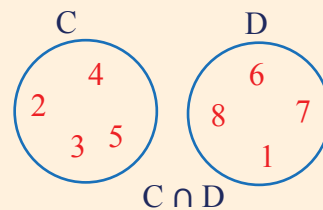
 $A \cup B$  $A \cap B$

Labada ururba waxay wadaagaan xubno.

Jaantuska 1.10

- t Haddii $C = \{2, 3, 4, 5\}$ iyo $D = \{1, 6, 7, 8\}$,
kadib $C \cup D = \{1, 2, 3, 4, 5, 6, 7\}$ iyo $C \cap D = \emptyset$

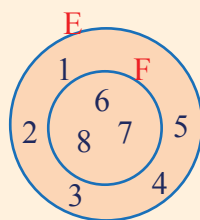
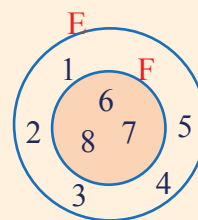
$C \cup D$ iyo $C \cap D$ waxaa lagu soo bandhigay qeybaha lahadheeyay (hadheeyan) ee jaantuska feenka soo socda ee ku yaala jaantuska 1.11:

 $C \cup D$  $C \cap D$

Labada ururo wax xubno ah mawadaagaan.

Jaantuska 1.11

- j Haddii $E = \{1, 2, 3, 4, 5, 6, 7, 8\}$ iyo $F = \{6, 7, 8\}$, kadib
 $E \cup F$ iyo $E \cap F$ waxaa lagu muujiyay qeybaha daahan ee jaantuska feenka soo socda ee gudaha jaantuska 1.12:

 $E \cup F$  $E \cap F$

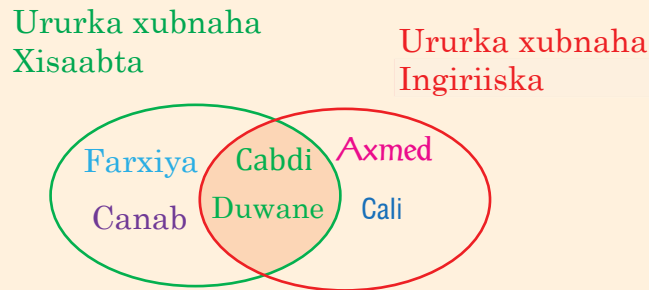
Ururka F wuxuu hormo urur oo (quman) u yahay ururka E.

Jaantuska 1.12

- F.G: b** Dhextaalka labo urur oo kasta oon lahayn wax wadaag ah waa urur madhan.
Tusaale ururka C iyo D ee kor lagu siiyay, $C \cap D = \emptyset$
- t** Hadduu yahay A urur kasta, kadib $A \cup \emptyset = A$, iyo $A \cap \emptyset = \emptyset$
- j** Haddii $F \subseteq E$, kadib $E \cup F = E$ iyo $E \cap F = F$

Tusaale 6: Qaar ka mid ah dugsiyada ayaa ururka M (xisaabta) waxaa xubno ka ah Duwane, Cabdi, Farxiya, iyo Canab, iyo ururka E (Ingiriiska) waxaa xubno ka ah Axmed, Duwane, Cali, Cabdi.

Furfuris: Isticmaal jaantuska feen si aad u muujisid xaalada.



Jaantuska feen ee sare (Jaantuska1.13) qeybta hadhaysan waxay natuseysaa Cabdi iyo Duwane in ay yihiin xubnaha ka midka ah labadaba xisaabta iyo ingiriiskaba; Farxiya iyo Canab waa xubnaha xisaabta kali ah meesha Axmed iyo Calina ka yihiin ingiriiska kali ah.

Laylis 1.6

- 1** Sawir jaantuska feen si aad u tustid xidhiidhaha ka dhaxeeya hormo ururada ardayda fasalkaaga ee soo socda.
- $F = \{x: x \text{ waa ardayda fasalkaada}\}$
- $M = \{y: y \text{ waa ardayda dhadig ee fasalkaada}\}$
- $R = \{z: z \text{ waa ardayda dhadig ee fasalkaada da'dooduna ka hooseyso 13 sano}\}$
- $P = \{w: w \text{ waa ardayda dhadig ee da'doodu u dhaxeeyso 10 ilaa 12 sano ee fasalkaada}\}$

2 Tus xidhiidhka ka dhaxeeya ururadan lamaan ee soo socda adeegsanaya jaantuska feen.

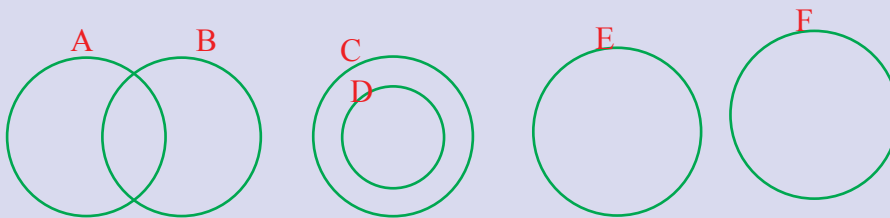
b Ururka laba jibaaranada iyo ururka laydiyada

t Ururka goobada iyo ururka laydiyada.

3 Koobiyeey ama rog jaantuska 1.14 oo hadhee qeybaha tilmaamaya

b Dhextaalka

t Isutagga talaabo walba.



Jaantuska 1.14

4 Isticmaal jaantuska feen si aad u xalisid masalooyinkan soo socda. Huteelka salaam ee ku yaala addis-ababa ayaa mar waxaa lagu sameeyay daraasaad ku saabsan 75 qof oo macaamiisha Huteelka ka mid ah. Natiijadii waxaa lahelay, 35 ka mid ah dadka iney jecelyihiin bariis, 41 ay jecelyihiin baastada, iyo 11 qofna ay jecelyihiin labadaba bariiska iyo baastada. Imisa qof ayaana jecleyn labadaba bariiska iyo baastada?

5 Makhaayad shaah ku dhexyaala dugsi ayaa kala weydiiyay 36 arday waxa ay xiseeyaan ee cabitaanadan kala ah: kooko koolo, Faanto, Isbirayd, natiijadii waxaa lagu taxay hoos.

| <i>Tirada ardayda</i> | <i>Waxa ay xiiseeyaan</i> |
|-----------------------|---------------------------|
| 25 | Koka koola |
| 20 | Isbirayd |
| 15 | Faanto |
| 2 | Saddexdaba |
| 1 | Ma xiiseeyaan saddexdaba |
| 15 | Koko koole/Isbirayd |
| 8 | Faanto ama kooko koole |
| 3 | Isbirayd bas ah |

b Sawir jaantuska feen oo lagu soo bandhigo jawaabaha

t Imisa arday ayaa jecel faantada kali ah?

j Imisa arday ay jecel faantada ama isbirayda

x Waa maxay labada cabitaano ee ay tahay in loo dalbo makhaayada? Sharaxaad ka bixi.

🔑 Hubin

| | |
|---|--|
| ↳ TaaganCalaamadaha lagu isticmaalay ururada | ↳ Dhextaalka ururada |
| ↳ Fikirada Ururada | ↳ Hormo urur |
| ↳ Hormo urur oo quman | ↳ Isutagga ururada |
| ↳ Jaantuska feen | ↳ Ku tiirsane/xubinka ururka |
| ↳ Kumuujinta/Kubandhigidda ururada jaantus | ↳ Calaamada ururka: $\{ \} \in, \notin, \neq, \emptyset$ ama $\{ \}$ |
| ↳ Urur | ↳ Ururada aan waxba wadaagin |
| ↳ Ururada isku dhegma | ↳ Ururada isle'eg |
| ↳ Ururka aan cayinayn | ↳ Ururka cayiman/xadidan |
| ↳ Ururka madhan | ↳ Xidhiidhka ka dhaxeeya Ururada |
| ↳ Xidhiidhyada: $\subseteq, \not\subseteq, =$ | ↳ Xisaab falada aas'aasiga ah ee ururada |
| ↳ Xisaab falka ururada: \cap, \cup | |

📖 Soo Koobidda Cutubka

1 Ururku waa waxyaalo/sheeyo si fiican oo qeexan isugu ururay.

Tusaale: b Ururada dhibcaha dhabanka.

$$t \quad A = \{1, 3, 5, 7, 9\}$$

2 Sheeyada ku jira ururka dhexdiisa waxaa loogu yeedhaa ku tirsanayaal ama xubnaha ururka, \in waa calaamada xubinimada, iyo \notin waa calaamada xubin ma noqoshada.

Tusaale: haddii $A = \{2, 4, 6\}$, kadib $2 \in A$, $4 \in A$, iyo $6 \in A$, laakiin $5 \notin A$.

3 Ururka madhan waa urur aan lahayn wax xubno ah; laguna calaamadiyo \emptyset ama $\{ \}$.

Tusaale: ururka tirooyinka Kisi ee tirsiimo ee u qeybsama 2.

4 Ururka koobana ah waa ururka xubnihiisu ay cayiman yihiin.

Tusaale: $\{1, 2, 3\}$ ururka aan koobnayn waa ururka aan xubnihiisu cayineyn,

Tusaale: $\{1, 2, 3, \dots\}$.

5 Ururka A wuxuu hormo urur u yahay B haddii xubin walba oo A ah uu xubin u yahay B. calaamada hormo urur waa \subseteq . Haddii A ayna hormo urur u ahayn B, waxaynu qori $A \not\subseteq B$.

Tusaale: haddii $A = \{1, 3, 5\}$ iyo $B = \{2, 4, 6\}$

6 Ururada aan wadaaga lahayn waa ururo ayna ka dhaxeeynin wax xubin ah.

Tusaale: $A = \{1, 3, 5\}$ iyo $B = \{2, 4, 6\}$ ma laha wax wadaag ah.

$$A \cap B = \emptyset$$

7 Ururka A wuxuu hormo quman u yahay ururka B haddii $A \subseteq B$ laakiin $B \subseteq A$.

Tusaale: haddii $A = \{a\}$, $B = \{a, b, c\}$, kadib $A \subseteq B$

8 Ururada isle'eg waa ururo sida xubno isku mid ah. $A = B$ haddii $A \subseteq B$ isla markaana $B \subseteq A$

Tusaale: Haddii $A = \{1, 3, 5, 7\}$ iyo

$$B = \{x \in \mathbb{N} : x \text{ ay tahay tiro Kisi oo ka yar } 9\}$$

$$\text{Kadib } A = B$$

9 Ururada isudhigma waa ururo isugu aadan mid-mid. Calaad isku isudhignaantu waa $A \leftrightarrow B$.

Tusaale: Hadey $A = \{1, 3, 5, 7, 9\}$ iyo $B = \{0, 2, 4, 6, 8\}$, kolkaa $A \leftrightarrow B$.

10 Dhextaalka labada urur A iyo B waa urur ka kooban xubnaha ay wadaagaan ururada A iyo B. Calamadiisu waa \cap . $A \cap B$ waxaa loo akhriyaa A dhextaal B.

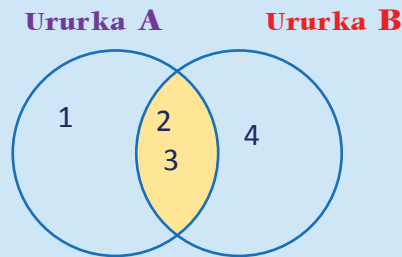
Tusaale: haddii $A = \{1, 2, 3\}$ iyo $B = \{2, 3, 4\}$, kolkaa $A \cap B = \{2, 3\}$.

11 Isu tagga labada urur A iyo B waa urur ka kooban dhammaan xubnaha A iyo xubnaha B. calamadiisu waa \cup . $A \cup B$ waxaa loo akhriyaa "A utagay B".

Tusaale: haddii $A = \{1, 2, 3\}$ iyo $B = \{2, 3, 4\}$, kadib $A \cup B = \{1, 2, 3, 4\}$.

- 12 Jaantuska feen waa sawiro lagu muujinayo ururada loona isticmaalo si loo muujiyo xidhiidhada ururada ka dhexeeya iyo xisaab falada ururada.

Tusaale: haddii $A = \{1, 2, 3\}$ iyo $B = \{2, 3, 4\}$, kadib $A \cap B = \{2, 3\}$ waxaa lagu muujin qeybta hadheysan ee jaantuska feen ee ku dhexyaala jaantuska 1.15.



Jaantuska 1.15

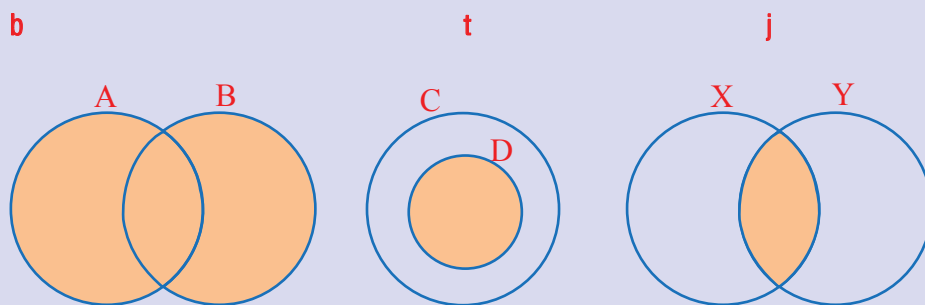
? Layliska Nakhtiinka ee Cutubka 1^{aad}

- 1 Sidan soo socota keebaa si fiican u qeexan? Sabab u yeel
 - b Ururka Wiilasha quruxdasan ee dugsiga.
 - t Ururka shaqalada yar ee alifbeetada ingiriiska.
 - j Ururka dhibcaha Kisi.
- 2 Kala saar ururka xadidan iyo ka aan xadidneyn,
 - b $A = \{1, 3, 5, 7, \dots\}$
 - t $B =$ ururka midhaha bunka ku jira gadbadda 100kg.
 - j $C =$ ururka tirooyinka tirsimo ee kaweyn 9.
 - x $x = \{\text{ardayda fasalka } 6^{\text{aad}} \text{ ee itoobiya}\}$
- 3 Qor labo hormo urur u ah ururka $A = \{4, 5, 6\}$
- 4 Ku qor calaamada saxda ah (\in ama \subset)

| | | |
|--------------------------|----------------------------------|-------------------------|
| b $5 \in \{1, 3, 5, 7\}$ | t $\{7\} \subset \{1, 3, 5, 7\}$ | j $\emptyset \in \{0\}$ |
|--------------------------|----------------------------------|-------------------------|
- 5 Ka soo qaad $A = \{2, 3, 4, 5, 6\}$ iyo $B = \{4, 5, 6, 7\}$, Raadi?

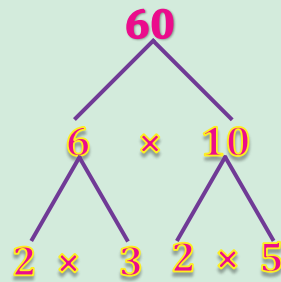
| | |
|--------------|--------------|
| b $A \cup B$ | t $A \cap B$ |
|--------------|--------------|

- 6 Kuwan soo socda kuwee baa ah urur madhan?
- b** Ururka ardayda fasalkaaga ee dhererkoodu yahay 3 metir.
- t** Ururka dhibcaha dhaban
- j** Ururka ayda duusha
- x** Ururka tirada Kisiee u dhaxeeya 13 iyo 15.
- 7 Tilmaan kuwan soo socda midda ah run ama been
- b** Ururka $\{1, 2, 3\}$ wuxuu hormo quman u yahay $\{1, 2, 3\}$.
- t** Urur kasta wuxuu isu yahay hormo urur
- j** Ururka $\{2, 4\}$ wuxuu hormo quman u yahay $\{2, 4\}$.
- x** Ururka madhan wuxuu hormo u yahay urur kasta oo lagu siiyay A.
- 8 Haddii $A = \{a, b, c, d\}$ iyo $B = \{1, b, 2, x\}$, kadib keebaa ah run?
- b** $A \cup B = \{a, d\}$ **t** $A \cap B = \{1, a, 2, b, c, d\}$
- j** $\{2, d\} \subseteq A$ **x** $A \cap B = \{a, d\}$.
- 9 Ka soo qaad $X = \{1, 2, 5, 7\}$ iyo $Y = \{2, 5, 6, 8\}$.
Sawir jaantuska feen si aad u tustid;
- b** $X \cup Y$ **t** $X \cap Y$
- 10 Qor ururka lagugu tusay qeybta hadheeyan ee jaantuska feen kaste ee ku dhex jira jaantuska 1.16



Jaantuska 1.16

CUTUBKA 2aad



QEYBSANAANTA TIROOYINKA IDIL

Maxsuulka Cutubka:

Cutubkan dabadii, ardaydu waxay awoodi doonaan;

- *kala saaridda u qeybsami ogida tirooyinka idil ay u qeybsamayaan 2, 3, 4, 5, 6, 8, 9 iyo 10.*
- *kala saaridda tirooyinka mutaxan iyo kuwa farcan.*
- *qoridda hab dhiska isiraynta mutaxan ee tirada idil ee lagu siiyay.*
- *kala soocidda isir weynaha ay wadaagaan labo ama saddex tirooyinka idil ee leh hal ama labo god.*
- *kala soocidda dhufsane yaraha ay wadaagaan labo ama saddex tirooyinka idil ee leh hal ama labo god.*

Tusmooyinka ugu muhiimsan:

2.1 Nuxurka u Qeybsanaanta

2.2 Dhufsanayaasha iyo Qeybshayaasha

Hubin

Soo koobid

Layliska nakhtiinka ah

HORDHAC

Cutubka 2^{aad} dhexdiisa waxaad ku baran doontaan u qeybsanaanta tirooyinka, tijaabinta u qeybsanaanta tirooyinka idil ee 2, 3, 4, 5, 6, 8, 9 iyo 10. waxaa garab socda ood baraneysaan dhufsanayaasha iyo isirada tirooyinka idil iyo sidii aad u raadin lahaydeen isir weynaha iyo dhufsane yaraha ay wadaagaan labo ama saddex tirooyinka idil ee leh hal ama labo god.

2.1 NUXURKA U QEYBSANAANTA

Ku furitaanka su'aal/masalo

Maalin ka mid ah ayaamaha todobaadka ayuu Xasan qorsheystay in uuku beero 144 geed gudaha dusigiisa oo kuwa bixiya midhaha ah. Imisa wado ayuu xasan ku beeri karaa geedaha isaga oo raacaya qaabka(foomka) laydiga?

Shaqo Kooxeed 2.1

Fiiri ururka ardayda ee fasalkaada. Waa imisa ardayda fasalkaada? Ma suurto galbaa in ardayda dhammaantood laga dhigo min labo kooxood? Min saddex kooxood? Min 5 kooxood? Ku falanqeeya su'aalahan idinkoo ah min 3 ilaa 5 kooxood. Waa maxay soo gunaanad-kaaga ku saabsan qeybsanaanta ardayda fasalkaaga?

Hadda si taxadar leh u eeg shaxda 1 ee hoose.

Tijaabooyinka u qeybsanaanta

Tirada idil waxay u qeybsami tiro kale haddii qeybta tirooyinka ay yihiin tiro tirsiiimo oo ka weyn 1 hadhaaguna yahay 0. Tusaale, 42 waxay u qeybsami 6. waxaynu kaloo dhihi karnaa, 6 waa qeybshaha 42, sababtoo ah $42 \div 6 = 7$.

Weydiinta haddii b ay u qeybsanto tiro kale oo ah t, waxay la micno tahay b loo qeybiyay t (taas oo ah $b \div t$) mana laha wax hadhaa ah (ama hadhaageedu waa 0).

Hawlgalka 2.1

| Qaar ka mid ah tirooyinka tirsiiimo (taxa 1 ^{aad}) | Dhufsanaha 2 (taxa 2 ^{aad}) | Dhufsanaha 3 (taxa 3 ^{aad}) | Dhufsanaha 5 (taxa 4 ^{aad}) | Dhufsanaha 9 (taxa 5 ^{aad}) |
|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 1 | 2 | 3 | | 9 |
| 2 | 4 | | 10 | 18 |
| 3 | | 9 | 15 | |
| 4 | 8 | | 20 | 36 |
| 5 | 10 | 15 | | 45 |
| 6 | | 18 | 30 | 54 |
| 10 | 20 | | 50 | 90 |
| 18 | 36 | 54 | | |
| 26 | | 78 | 130 | 234 |
| 44 | 88 | | 220 | 39 |

Si taxadar leh u eeg tirooyinka sida ay u habaysan yihiin joogtax kasta.

- b** Waa maxay boosaska hal-godlaha ee tiro kasta oo joogga taxa 2^{aad} ah? Maxay kala yihiin godadkaasi? Maxaad dhihi kartaa u qeybsanaanta tirooyinka ay u qeybsamaan 2?
- t** Hadda si taxadar leh u fiiri tirooyinka joogga taxa 3^{aad}. Soo qaado tirooyinka qaar ka mid ah; iskudar gododka midwalba iyo u qeybi wadartooda 3. Wadar walba ma u qeybsantaa 3? Haddey sidaa tahay, waa maxay waxaan dhihi karnaa u qeybsanaanta tirooyinka ay u qeybsamaan 3?
- j** Sidoo kale bal fiiri tirooyinka hal-godlaha ee joogga taxa 4^{aad}. Maxay yihiin gododka 2 Maxaan dhihi karnaa tirooyinka u qeybsama 5?

Hadda jawaabahaaga hawlgalka sare ku hubi xeerarkan soo socda.

Xeerka 1^{aad}

Jooga taxa 2^{aad} wuxuu ka kooban yahay natiijada dhufsanaha 2. tirada booska hal-godle kasta waa 0, 2, 4, 6, 8. waxaad arki kartaa tira walba oo idil iney u qeybsanto 2 haddii tirada booska hal-godlaha u yahay 0, 2, 4, 6 ama 8.

Xeerka 2^{aad}

Hadda si taxadar leh u eeg maxsuulka dhufsanaha 3 ee ku jira joogga taxa 3aad, waxaad eegi kartaa wadarta godadka tiro walba in ay u qeybsami karto 3. Tusaale; wadarta godadka ku jira 54 (kuwaas oo ah $5 + 4 = 9$) waxay u qeybsami 3.

Sidaa darteed, tiro walba waxay u qeybsantaa 3, haddii wadarta godadka tiradaa ay u qeybsami 3.

Xeerka 3^{aad}

Fiiri joogga taxa 4^{aad} “Dhufsanaha 5” Booska hal-godlaha tiro walba oo ka mid ah taxa waa midkood 0 ama 5.

Sidaa awgeed, tiro idil oo kasta waxay u qeybsantaa 5 haddii booska hal-godlaha ee tirada u yahay midkood 0 ama 5.

Xeerka (Tijaabada) qeybiyaasha 2, 3, ama 5

Si aan u tijaabino u qeybsanaanta tirada idil ee qeybiyaasha 2, 3 ama 5.

- i Haddii hal godlaha tiradu uu yahay 0, 2, 4, 6 ama 8, kadib tiradu waxay u qeybsantaa 2.
- ii Haddii wadarta gododka tiradu ay u qeybsanto 3, kadib tiradu waxay u qeybsantaa 3.
- iii Haddii tirada hal godluhu u yahay 0 ama 5, kadib tiradu waxay u qeybsantaa 5.

Xusuusnaw 0, 2, 4, 6, 8 in ay yihiin gododka dhaban; iyo 1, 3, 5, 7, 9 ay yihiin gododka Kisi. Waxaan kaloon ku qeexi karnaa xeerka 1^{aad} ee sare “hadey tiradu tahay” dhaban, kadib waxay u qeybsantaa 2.

Tusaale 1: 85 ma u qeybsantaa 2, 3 ama 5?

Furfuris:

- ◆ 85 u ma qeybsanto 2, sababtoo ah booska hal-godluhu ma aha dhaban.
- ◆ 85 uma qeybsanto 3, sababtoo ah wadarta gododka:
 $8 + 5 = 13$; islamarkaana wadarta gododka ku jira 13 waa $3 + 1 = 4$, taas oo u qeybsamin 3.
- ◆ 85 way u qeybsantaa 5, sababtoo ah booska hal-godlihiisu waa (5).

Bal markale aan eegno shaxda 1 ee kore. Shaxdan gudaheeda, qaar ka mid ah tirooyinka ayaa waxay ka muuqdaan labaduba joogga taxa “dhufsanaha 2” iyo “dhufsanaha 3”. Tusaale tirooyinka 18 iyo 54 ba waxay ka muuqdaan labada taxba

kuwaas iyo tirooyinka kale ee ku jira labadaa taxba waxay u qeybsamaan 6.

($18 \div 6 = 3$; $54 \div 6 = 9$) sababtoo ah $6 = 2 \times 3$, tiro walba oo u qeybsanta 6, waa in ay u qeybsantaa 2 iyo 3 ba. Tusaale 132 waxay u qeybsantaa 2 iyo 3.

Sidaa awgeed, 132 waxay u qeybsami b.

Taxa “dhufsanaha 9” ee shaxda 1 sare, wadarta gododka tiro walba waxay u qeybsantaa 9. Tusaale wadarta gododka 36 waa $3 + 6 = 9$, taas oo u qeybsanta 9, tani waxay noqon run markii loo eego dhammaan tirooyinka ku jira taxa 5^{aad}. Sidaa darteed, tiro walba waxay u qeybsantaa 9, haddii wadarta gododka tirada ay u qaybsanto 9.

Ogsoonaw, maadaama 0 ay tahay dhaban, dhammaan tirooyinka tirsiiimo ee ku dhammaada 0 waxay u qeybsamaan 2. Waxay kaloy u qeybsamaan 5 sababtoo ah dhammaadku waa 0. Tirooyinkaasi waxay kaloy u qeybsamaan 10. Waxay ka muuqdaan taxaha “dhufsanaha 2” iyo dhufsanaha 5”.

Xeerka u qeybsanaanta 6, 9, ama 10

Tijaabinta qeybsanaanta tirooyinka idil ee 6, 9 ama 10.

- 1 **Xeerka 4^{aad}** Haddii tiro ay u qeybsanto 2 iyo 3. tiradu waxay u qeybsantaa 6.
- 2 **Xeerka 5^{aad}**, haddii wadarta godadku ay u qeybsanto 9, kadib tiradu waxay u qeybsantaa 9.
- 3 **Xeerka 6^{aad}**, Haddii booska koowaadku yahay 0, tiradu waxay u qeybsantaa 10.

Tusaale 2: 720 ma u qeybsantaa 6, 9, ama 10? Sabab?

- ◆ 720 wey u qeybsantaa 6, maadaama $720 \div 6 = 120$ ay u qeybsanto 2 iyo 3.
- ◆ 720 wey u qeybsantaa 9, maadaama $7 + 2 = 9$, taa oo u qeybsami 9.
- ◆ 720 waxay u qeybsantaa 10, maadaama booska halgodluhu uu yahay 0.

Laylis 2.1

- 1 Tiro walba ma u qeybsantaa 2? 3? 5? Sharaxaad ka bixi;

| | | | | | | | | | |
|----------|----|----------|----|----------|----|----------|-----|-----------|------|
| b | 25 | t | 30 | j | 73 | x | 346 | kh | 1034 |
|----------|----|----------|----|----------|----|----------|-----|-----------|------|
- 2 Tus iney tiro walba ay u qeybsanto 2, 3, ama 5 iyo in kale.

| | | | | | | | |
|-----------|------|----------|------|----------|------|----------|------|
| b | 3660 | t | 2670 | j | 3998 | x | 4998 |
| kh | 4815 | d | 1845 | r | 5280 | s | 7275 |

- 3** Tiro walba ma u qeybsantaa 6? Sabab?
- | | | | | | | | | | |
|----------|-----|----------|-----|----------|-----|----------|-----|-----------|-----|
| b | 108 | t | 333 | j | 254 | x | 444 | kh | 900 |
|----------|-----|----------|-----|----------|-----|----------|-----|-----------|-----|
- 4** Tiro walba oo soo socota ma u qeybsantaa 9? Sabab?
- | | | | | | | | |
|-----------|------|----------|-----|----------|-----|----------|-----|
| b | 108 | t | 801 | j | 376 | x | 414 |
| kh | 1152 | | | | | | |
- 5** Tiro walba oo soo socota ma u qeybsantaa 10? Sabab?
- | | | | | | | | | | |
|----------|-----|----------|-----|----------|-----|----------|-----|-----------|------|
| b | 233 | t | 330 | j | 875 | x | 607 | kh | 1770 |
|----------|-----|----------|-----|----------|-----|----------|-----|-----------|------|
- 6** Go'aanso tirooyinkan soo socda in ay u qeybsamaan 6,9, ama 10 iyo in kale.
- | | | | | | | | |
|-----------|------|----------|------|----------|------|----------|------|
| b | 4920 | t | 4896 | j | 6993 | x | 4998 |
| kh | 3780 | d | 5555 | r | 5700 | s | 7880 |
- 7** Jamaal iyo afar saaxiibadii ah waxay qorsheysteen iney ordaan 82km. Ma suurto galbaa orod yahan kaste in ay ordaan tiro (km) idil oo isku mid ah iney ordaan?
- 8** Marlabad waxay leedahay ayaa wuxuu leeyahay kabadh balaciisu uu yahay 36cm. waxay rabtaa iney ku isticmaasho buugaagta xisaabta bug walbana buuridiisu ay tahay 2cm. Ma suurto galbaa in ay kabadhka ka buuxiso buugaagta? Sabab? Miyey kartaa in kabadhka si dhameystiran ay ooga buuxiso mug dhan 3cm? sabab?
- 9** Baandhiga baanbeyda booliska ayaa waxay leeyihiin 175 xubnood?
- | | |
|----------|---|
| b | bandhigu ma u feyli karaan min laba qof iyada oo wax dheeri ah jirin? |
| t | Ma noqon karaan 3 fiilo? |
| j | Ma noqon karaan 5 fiilo? Sabab u yeel? |

Xeerka u qeybsanaanta ee 4 ama 8

Waxaa ku xigta, waxaynu baran doonaa tijaabinta tirooyinka idil ee u qeybsama 4 ama 8. Si fudud waxaad utijaabin kartaa qeybsanaanta hal-godlaha iyo labo godlaha inagoo tirooyinka idil u qeybineyna 4 ama 8. Tusaale, tijaabinta 74 iney u qeybsanto 4 iyo inkale, waxaynu 74 u qeybin 4.

$$74 \div 4 = 18, \text{ hadhaa } 2.$$

Sidaa awgeed, 74 uma qeybsanto 4. sababtoo ah hadhaagu ma aha 0 (hadhaagu waa 2) laakiin haddii 84 aad u qeybisid 4, waxaynu heleynaa 21 hadhaaguna yahay 0. Sidaa awgeed, 84 waxay u qeybsantaa 4.

Hadda su'aashu waxay tahay sidaad u sheegi lahayd tirooyinka idil ee haysta godod badan iney u qeybsamaan 4 ama 8 iyo in kale, adoon u qeybineynin?

Waxaad ku baran doontaa cashiradan soo socda.

Marka hore bal aan eegno tijaabooyin muhiim ah oo ku saabsan taranta u qeybsanaanta iyo wadarta ama faraqa tirooyinka qeybsama.

i Taranta qeybsanaanta

Xusuusnaw, $4 \times 5 = 20$, tirooyinka 4 iyo 5 waxaa loogu yeedhaa isiro ama qeybshe. 20 kana waxaa loogu yeedhaa taranta 4 iyo 5. Waxaan kaloo dhihi karnaa 20 waxay u qeybsantaa 4 iyo 5. Ogsoonaw, taranka “ 15×14 ” waxay u qeybsantaa labadaba 15 iyo 14.

Waxaa kalood ku hubin kartaa in uu tarantu u qeybsamo 5 iyo 7 iyada oo la iskudhufanin tirooyinka.

$$\begin{aligned} 15 \times 14 &= (5 \times 3) \times 14 && \text{iyo} && 15 \times 14 &= 15 \times (2 \times 7) \\ &= 5 \times (3 \times 14) && && &= (15 \times 2) \times 7 \end{aligned}$$

Taranka “ 15×14 ” ma aha iney u qeybsanto oo keli ah qeybshe yaashooda 15 iyo 14; ee waxaa kaloo jira qeybshe-yaal kale, tusaale, waxay kaloo u qeybsamaan 2, 3, 5. Marka Hadda waxaynu sheegi qeybsanaanta taranta sida soo socota.

U Qeybsanaanta taranta:

Haddii isirka tirada m ay u qaybsanto ugu yaraan hal qeybshe tirada 2aad n (Markey $m > n$), kadib m waxay u qeybsantaa n .

Tusaale 3: 900 ma u qeybsantaa 4? Sabab?

Furfuris: $900 = 9 \times 100$

Waxad ogtahay 100 in ay u qaybsanto 4 sida 4×25

Sidaa darteed, 900 waxay u qeybsantaa 4. (qeybsanaanta taranka)

ii U Qeybsanaanta wadarta/faraqa, fiiri shaxdan soo socota

Shaxda 2:

| b (taxa 1 ^{aad}) | t (taxa 2 ^{aad}) | b Ma u qeybsama 3? (taxa 3 ^{aad}) | t ma u qeybsantaa 3 (taxa 4 ^{aad}) | b + t ma u qeybsantaa 3 (taxa 5 ^{aad}) |
|-------------------------------|-------------------------------|---|--|--|
| 12 | 5 | Haa | Maya | Maya |
| 17 | 20 | | | |
| 15 | 27 | | | |
| 48 | 54 | | | |

Hawlgalka 2.2

Intaad koobiyeysid ama roqatid shaxda 2 ee kore kadibna buuxi meelaha banaan. Si taxadar leh u fiiri jawaabaha joogga taxa 5^{aad} adoo la xidhiidhinaya joogga taxa 3^{aad} iyo joogga taxa 4^{aad}, goormey jawaabta taxa 5^{aad} ay noqotaa haa? Midaasi ma goortii wadarta labada tiro ay u qeybsanto 3 miyaa?

F.G: Qeybsanaanta wadarta: Haddii labo tirooyinka idil ah a iyo b ay u qeybsamaan tiro tirsimo n , kadib $a + b$ waxay u qeybsami n .

Tusaale 4: 936 ma u qeybsantaa 4?

Furfuris: Si aan u hubino, Marka hore aan cadeyno 936 in ay tahay labo tiro oo la iskudaray, midda 1^{aad} ay tahay dhufsanaha 100 iyo tan labaadna ay ka yartahay 100.

$$936 = 900 + 36 = (9 \times 100) + 36$$

900 waxay u qeybsantaa 4 maxaa yeeley $900 = 9 \times 100$ iyo 100 waxay u qeybsantaa 4. Waxaad si fudud u aragtaa in ay 36 u qeybsanto 4, sababtoo ah $36 = 4 \times 9$.

Sidaa awgeed, 936 waxay u qeybsantaa 4 (qeybsanaanta wadarta).

Hawlgalka 2.3

Maxaad ka fahantay tusaalaha 4 ee kore? Waa midkee gadaal biirayaasha midka ugu tilmaan fiican ee tijaabinta u qeybsamida 4, ma ka koobaad mise midka 2^{aad}? Sabab?

Haddii tiro idil lagu qeexo sida wadarta labo gadaal birayaal, oo midka 1^{aad} yahay dhufsanaha 100 iyo midka 2^{aad} u ka yaryahay 100, maadaama dhufsanaha 100 kaste uu u qeybsamo 4, gadaal biiraha 1^{aad} wuxuu u qeybsamaa 4. Laakiin gadaal biiraha 2^{aad} wuxuu ka kooban yahay labada god ee ugu danbeeya. Haddii gadaal biiraha 2^{aad} u isna u qeybsamo 4, kadib waxaynu odhan karnaa tirada nala siiyay waxay u qeybsantaa 4; haddii kale uma qeybsanto 4. si aan u tijaabino in tirada idil ay u qeybsanto 4 iyo in kale;

Waxaad u baahan oo keli ah in aad tijaabisid gadaal biiraha 2^{aad}. (kaas oo ka kooban labada god ee ugu danbeeya) in uu u qeybsamo 4.

Macno ahaan, si aan u tijaabino tiradu in ay u qeybsanto 4, ta loo baahan yahay in aad ka walbahaarto waa labada god ee u danbeeya! Markaan soo gaabsano, waxaad ku sharxi tijaabada u qeybsanaanta 4 sidan soo socota;

Tijaabada u qeybsamida 4:**Xeerka 7^{aad}**

Tiradu waxay u qeybsantaa 4 haddii tirada sameysantay labada god ee u danbeeya ay u qeybsanto 4.

Tusaale 5: Tiro walba ma u qeybsantaa 4? Sabab u yeel.

b 4648

t 12622

Furfuris:

b 4648 waxay u qeybsanta 4 sababtoo ah 48 waxay u qeybsantaa 4

t 12622 uma qeybsanto 4 sababtoo ah 22 uma qeybsanto 4.

Sidoo kale, waxaynu waddadan mid la mid ah u mari tijaabinta u qeybsamida 8. Marka hore tirada idil waxaad ku qeexi sida isku darka labo gadaalbiire, oo midda hore ay tahay dhufsanaha 1000 iyo tan labaadna ay ka yartahay 1000. Haddii tirada lagu qeexo waddadaa, waxaad taqaanaa tirada 1^{aad} iney u qeybsami 8 sababtoo ah waa dhufsanaha 1000 haddii gadaal biiraha labaadna uu u qeybsamo 8, kadib waxaynu odhan karnaa tiradaasi waxay u qeybsantaa 8.

Tusaa 6: Tirada 2640 ma u qeybsantaa 8? Sabab u yeel.

Furfuris: $2640 = 2000 + 640 = 2 \times 1000 + 640$

2000 waxay u qeybsantaa 8, waayo waa dhufsanaha 1000;

maadaama $1000 = 125 \times 8$

640 waxay u qeybsantaa 8, waayo

$640 = 8 \times 80$

Sidaa awgeed, 2640 waxay u qeybsantaa 8.

Xeerka 8^{aad}: Tijaabada u qeybsamida 8

Tiradu waxay u qeybsami 8 haddii tirada ka abuuranta saddexda god ee oogu danbaysa ay u qeybsanto 8.

Laylis 2.2

1 Go'aami $x + y$ ay u qeybsanto z iyo in kale. Sabab u yeel.

b $x = 600, y = 78, z = 4$

t $x = 78, y = 36, z = 6$

j $x = 21, y = 220, z = 7$

2 Dheh Run ama been

b 5 waa qeybshaha $65 + 70$ **t** 4 waa qeybshaha $240 + 38$.

j 3 waa qeybshaha $220 + 25$.

3 Tiro kasta oo soo socota ma u qeybsantaa 4? Sabab?

b 5716 **t** 724 **j** 4075

x 3120 **kh** 37952

4 Ka bixi 5 tusaale tirooyinka u qeybsama 4. Tiro kaste waa in ay lahaato 5 god.

5 Ka soo qaad 7×32 in ay tahay tiro idil oo leh afar god. Waa maxay godka loo baahan yahay in uu badalo * sidaa darteed, ay tiradu noqoto mid u qeybsanta 4?

6 Tirooyinkan soo socda ma yihiin kuwo u qeybsama 8? Sabab?

b 27320 **t** 45776 **j** 3056

x 73641 **kh** 53128

7 Tiro idil oo leh 5 god $5312 \times$ ayaa waxay u qeybsantaa 8. Godka muxuu u taagan yahay?

8 Go'aanso tirooyinkan soo socda in ay u qeybsamaan 4 ama 8 iyo in kale.

b 918 **t** 2470 **j** 1700

x 2348 **kh** 16454

9 Intaad koobiyeysid dhammeystir shaxdan.

| | | | | | | | |
|--|---|---|---|---|---|---|----|
| Tiro walba oo tirsiiimo kuna dhammaata | 0 | 2 | 4 | 5 | 6 | 8 | 10 |
| Waxay u qeybsantaa | | | | | | | |

10 Go'aanso tirooyinkan soo socda midka u qeybsama

i 10 **ii** 100 **iii** 2 **iv** 5?

b 120 **t** 159 **j** 6,400 **x** 24,030

kh 8,775 **d** 56,040 **r** 780,000

11 120 ardayo ayaa waxay tahay in ay isu qeybiyaan kooxo isle'eg si ay shaqo u qabtaan. Raad si walba oo ay suurtagal u noqoto in ay ardaydu isuqeybiyaan kooxo.

12 Maktabada dugsi oo cusub ayaa wuxuu haystaa 3,488 oo buugaag ah. Masuulka maktabada ayaa wuxuu rabaa in uu dhigo qol walba buugaag isku nooc ah oo u dhaxeeya 500 ilaa 1000. Imisa qol ayuu maktabadu yeelan karaa?

2.2 DHUFSANAYAASHA IYO ISIRADA

Hawlgalka 2.4

Si fiican oo taxadar leh u akhri xogta hoos lagugu siiyay.

Warshad saabuun ah ayaa waxay soo saartaa labo nooc oo saabuuna'ah. Nooca koobaad qaabkeedu waa laydi ahaan iyo waxay leedahay dhinacyada 10mm, 5mm iyo 3mm. nooca labaadna wuxuu leeyahay qaabka saddex jibaaranaha iyo dhererka cidhifkiisu uu yahay 5mm.

Warshadu waxay rabtaa saabuun nooc walba'ah in ay ku xidho sanduuqyo (kaartoono) kala duwan oo dhinacyaduna yihiin 30cm, 20cm, 15cm.

- b** Ma suurto galbaa in kaartoonada si dhammeystiran looga buuxiyo saabuunta qaabkeedu yahay laydiga?
- t** Ma la karaa kaartoonka si dhammeystiran in looga buuxiyo saabuunta qaabkeedu yahay saddex jibaaranaha?

Jawaabaha su'aalahaas waxay u baahan yihiin fahanka dhufsanayaasha iyo isirada ama qeybshe-yaasha. Cutub-yarahan waxaad ku baran doontaa dhufsanayaasha iyo qeybshe yaasha tirooyinka idil.

2.2.1 Nakhtiinka Dhufsanayaasha iyo Isirada

Iskudhufasho kasta tirooyinka la isku dhufanayo waxaa loogu yeedhaa **Isiro** natiijadana waxaa loogu yeedhaa **Taran**. Isirku waa tiro lagu dhufanayo tiro kale si loo helo taranta.

$$\text{Isir} \quad \text{Isir} \quad \text{Taran}$$

$$2 \quad \times \quad 3 \quad = \quad 6$$

Iskudhufashadan dhabta ah waxaynu ka sameyn karnaa labo u qeybi ah:

$$6 \div 2 = 3 \quad \text{iyo} \quad 6 \div 3 = 2$$

Sidaa awgeed, 6 waxay u qeybsami kartaa 2 iyo 3. waxaynu dhihi karnaa 2 iyo 3 waa isirada ama (qeybshaha) 6. Waxaa kaloon dhihi karnaa 6 waa dhufsanaha 2 iyo 3.

| | | | |
|-----|--|------------|--|
| F.G | d waa dhufsanaha c c waa isirka c cwaa qeybshaha d | Macnaheedu | Waxaa jira tiro idil n taas oo ah: $d = c \times n$ |
|-----|--|------------|--|

Tusaale 1: 35 waa dhufsanaha 7 sababtoo ah $7 \times 5 = 35$.

5 iyo 7 waa isirada 35, sababtoo ah $5 \times 7 = 35$.

6 ma aha isirka 35, sababtoo ah ma jiro tiro idil oo intii lagu dhufsto 6 nasiineysa 35

(Tusaale, $5 \times 6 = 30$ iyo $6 \times 6 = 36$).

Dhufsanaha tiro idil waa taranka tiradaa iyo tiro idil.

Waxaan heleynaa dhufsanayaasha tirada n inaga oo ku dhufanna n tiro idil.

Tusaale ahaan: si aan u helno dhufsanayaasha 4, waxaynu 4 ku dhufan tiro kasta oo idil.

Shaxda 3:

| Tiro idil | Dhufsanayaash 4 |
|-----------|--------------------|
| 0 | $0 \times 4 = 0$ |
| 1 | $1 \times 4 = 4$ |
| 2 | $2 \times 4 = 8$ |
| 3 | $3 \times 4 = 12$ |
| 4 | $4 \times 4 = 16$ |
| 5 | $5 \times 4 = 20$ |
| ... | ... |
| 15 | $15 \times 4 = 60$ |
| 16 | $16 \times 4 = 64$ |
| ... | ... |

Shaxda 3 ee kore wey socon kartaa xad la'aan. Sidaa awgeed dhufsanayaasha 4 waxay yihiin 0, 4, 8, 12, 16, 20,

F.G: a waa dhufsanaha b waxay la micno tahay waxa jira tiro taas oo ah.

$a = b \times n$. (a, b iyo n ay yihiin tirooyin idil).

Hadeyn jirin tiro idil n kadhigeysa qaaciidada $a = b \times n$ run, kadib a dhufsane uma aha b.

Tusaale, 18 uma aha dhufsane 5, sababtoo ah ma jirto tiro idil n oo kadhigeysa

$5 \times n = 18$ run. ($3 \times 5 < 18 < 4 \times 5$) ado ka duulaya kor, waxaad soo saari kartaa qaar ka mid ah dabecadaha dhufsanayaasha sidan soo socota;

1 Tiro kasta waa dhufsanaha 1.

Tusaale: $7 = 1 \times 7$, $13 = 1 \times 13$, i.w.m

2 Tiro kasta waa dhufsanaha laftigeeda.

Tusaale: $5 = 5 \times 1$, $17 = 17 \times 1$, i.w.m

3 Ebar waa dhufsanaha tiro walba.

Tusaale: $0 = 8 \times 0$, $0 = 73 \times 0$, i.w.m

Tiro walba oo idil ka sareysa 1 waxay leedahay ugu yaraan labo qeybsheyaal oo kala duwan, waxaa lagu magacaabaa 1 iyo qudhigeeda. [dabeecadaha 1 iyo 2 ee kore].

Ebar (0) looma qaato qeybshe ahaan laakiin tiro walba (waxaan ka'ahayn 0) waa qeybsaha 0 [dabeecada 3 ee kore].

Laylis 2.3

1 Go'aami 42 iney tahay iyo in kale dhufsanaha 7, 6, 5 sabab u yeel,

2 Weedhahan soo socda keebaa run ah? Kaabaa been ah? Sabab u yeel?

b 12 waa dhufsanaha 2 **t** 18 waa dhufsanaha 3

j 35 waa dhufsanaha 5 **x** 52 waa dhufsanaha 4

kh 62 waa dhufsanaha 8.

3 Go'aami in ay tahay iyo in kale;

b 24 waa dhufsanaha 4 **t** 74 waa dhufsanaha 4

j 100 waa dhufsanaha 4. Sabab u yeel mid walba

4 **b** Raadi dhufsanayaasha 3 ee u dhaxeeya 47 iyo 62.

t Raadi dhammaan tirooyinka u dhaxeeya 35 iyo 47 oon ahayn dhufsanayaasha 3.

5 Hubi iney tahay iyo in kale b dhufsanaha t

| | | | | | | | | | | |
|----------|----|----|---|----|----|----|---|----|---|----|
| b | 42 | 28 | 9 | 14 | 27 | 0 | 1 | 13 | 0 | 2 |
| t | 7 | 6 | 0 | 14 | 3 | 18 | 9 | 1 | 0 | 12 |

6 Tirooyinkan 56, 42, 36, 81, 63, 87, kuweebaa ah

b dhufsanayaasha 9? **t** ma aha dhufsanayaasha 9?

j dhufsanayaasha 7? **x** ma aha dhufsanayaasha 7?

kh Dhufsanayaasha labadaba 9 iyo 7?

7 Hubi in ay b tahay isirka a iyo in kale;

| | | | | | | | | | | |
|----------|----|----|----|----|----|---|---|----|---|-----|
| b | 5 | 7 | 8 | 1 | 17 | 0 | 4 | 6 | 9 | 10 |
| t | 15 | 77 | 65 | 10 | 17 | 8 | 0 | 72 | 3 | 100 |

8 Tus isirada ay leeyihiin dhammaan tirooyinkan soo socda.

| | | | | | |
|----------|----|-----------|----|----------|----|
| b | 16 | t | 15 | j | 18 |
| x | 55 | kh | 81 | d | 23 |

9 Intaad rogatid dhameystir shaxdan soo socota

| | x | y | $x \div y$ | $y \div x$ | y ma u tahay dhufsane x ? | x ma u tahay dhufsane y ? |
|----------|-----|-----|------------|---------------|-------------------------------|-------------------------------|
| b | 45 | 9 | 5 | Xalin ma'laha | Haa | Maya |
| t | 80 | 4 | | | | |
| j | 30 | 30 | | | | |
| x | 12 | 0 | | | | |

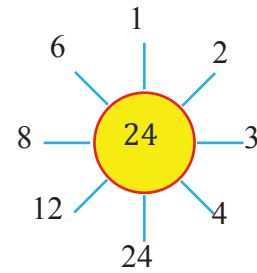
2.2.2 Tirooyinka Mutaxan iyo Kuwa Farcan iyo habka isirada Mutaxan

Hawlgalka 2.5

Ku rogo buugaada kadibna dhameystir shaxdan soo socota.

| Tiro | Isiro | Tirada Isirada |
|------|---------|----------------|
| 1 | 1 | 1 |
| 2 | 1, 2 | 2 |
| 3 | 1, 3 | 2 |
| 4 | 1, 2, 4 | 3 |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |

Waa suurto gal in lataxo dhammaan isirada tirada idil ee lagu siiyay. Tusaale, si aad u heshid isirada 24 waxaad u baahan in aan raadino dhammaan tirooyinka lamaan ee tarantoodu noqonayo 24. si aan u sameyno sidan waxaad isticmaali karnaa jaantus, marmarka qaarkood loogu yeedho “xidigta isirada”, sida lagugu tusay [jaantuska 2.1](#).



Jaantuska 2.1

Bal aan eegno tirooyinka kale.

Tusaale: tirada 1 waxay leedahay hal isir, taas oo ah 1. Tirooyinka idil ee kale waxay leeyihiin ugu yaraan labo isir: 1 iyo tirada qudhigeeda. Tirooyinka qaarkood waxay leeyihiin 2 isir oo kaliya, iyo kuwa kale oo leh in kabadan labo. Tusaale, 0 waxay leedahay tirooyin isiro oon xad lahayn.

Tusaale 2:

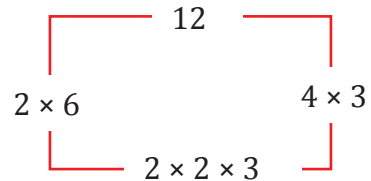
- b** $12 = 1 \times 12 = 2 \times 6 = 3 \times 4$
- t** $5 = 1 \times 5$
- j** $1 = 1 \times 1$
- x** $0 = 0 \times 1 = 0 \times 2 = 0 \times 3 = 0 \times 4 = \dots$

Tiro kaste oo idil waxaa lagu qeexi karaa sida taranka isiradiisa. Haddii isirada taran kaste ay ka weynyihiin 1, kadib habkani waxaa loogu yeedhaa isireynta tirada idil. Tusaale, 1×2 ma’aha isireynta 12; meesha 2×6 iyo 3×4 ay ka yihiin isireynta 12.

Tirada lagu siiyay

Isireynta iyada oo la isticmaalayo labo tiro..

Markii isireyntu ay sii socoto.....



Sida kor lagugu tusay, isireynta ugu danbeysa ee 12 waa $2 \times 2 \times 3$. Sababta aan u leenahay waa ugu danbeyn tirooyinka 2 iyo 3 mid walba waxay leedahay labo isir, 1 iyo lafteeda. Taas oo ah, 1 iyo 2 waa labada isir ee keli ah ee 2; 1 iyo 3 na waa labada isir ee keli ah ee 3.

Hawlgalka 2.6

Adoo kaashanaya tusaalaha 2 samee adoo taxaya qeybsamida tirooyinka u dhaxeeya 1 iyo 20 sida lagugu tusay shaxda 4 ee hoose.

- b** Goobo gali tirada u qeybsanta 1 iyo iyada laftigeeda oo keli ah
- t** Hoos ka xariiq tiro walba oo leh in kabadan labo isir.

Shaxda 4:

| Tiro | u qeybsanta (isiro) | Tiro | u qeybsanta (isiro) | Tiro | u qeybsanta (isiro) | Tiro | u qeybsanta (isiro) |
|------|---------------------|------|---------------------|------|---------------------|------|---------------------|
| 1 | 1 | 6 | | 11 | | 16 | |
| 2 | | 7 | 1,7 | | | 17 | |
| 3 | | 8 | | 13 | 1,13 | 18 | 1, 2, 3, 6, 9, 18 |
| 4 | | 9 | | 14 | | 19 | |
| 5 | | 10 | 1, 2, 5, 10 | 15 | | 20 | |

Qeexid 2.1: Tiro mutuxan waa tiro idil oo ka weyn 1 lehna labo isir oo kala duwan. Labada isir waa 1 iyo tirada qudhigeeda. Tiro farcan waa tiro idil oo kaweyn 1 lehna in kabadan labo isiro. Tirooyinka idil ee 1 iyo 0 ma aha tiro mutuxan iyo tiro farcantoona.

Tusaale 3: b $12 = 2 \times 6 = 2 \times 2 \times 3$

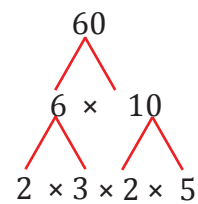
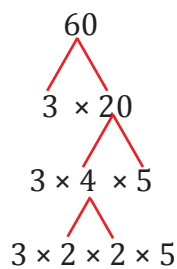
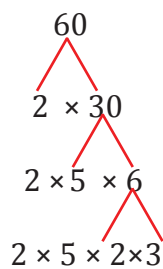
t $27 = 3 \times 9 = 3 \times 3 \times 3$

j $60 = 2 \times 30 = 2 \times 2 \times 15 = 2 \times 2 \times 3 \times 5$

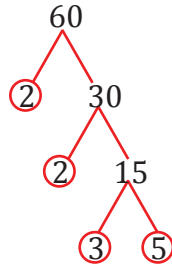
x $90 = 2 \times 45 = 2 \times 3 \times 15 = 2 \times 3 \times 3 \times 5$

Markii tiro lagu qeexo taranta isirada ee dhammaan ah tiro mutuxan, sifadaa waxaa loogu yeedhaa isireynta mutuxan.

Jaantus walba ee hoos ku xusan waxay natusinayaan siyaabaha kala duwan ee loogu helo isireynta mutuxan ee 60.



Ogsoonaw falaadhaha geedeynta isir kasta waa isku mid waxaan ka ahayn habka isirada loo taxay. Tiro walba urur gooni u ah oo isirada mutuxan ah ayuu leeyahay. Isireynta mutuxan ee 60 waxaa si fudud loogu heli karaa iyada oo la adeegsanayo geedka isirka ee soo socda;



Isireynta mutuxan ee 12, 27, 60 iyo 90 waxaa kaloo lagu qori iyada oo la adeegsanayo tidica jibaaranaha sida;

b $12 = 2 \times 2 \times 3 = 2^2 \times 3$

t $27 = 3 \times 3 \times 3 \times 3 = 3^3$

x $90 = 2 \times 3 \times 3 \times 5 = 2 \times 3^2 \times 5$.

Laylis 2.4

- 1 Raadi dhammaan isirada tirooyinkan soo socda, adoo adeegsanaya “isirka-xidigta”.

| | | | |
|-------------|-------------|-------------|-------------|
| b 16 | t 35 | j 17 | x 20 |
|-------------|-------------|-------------|-------------|
- 2 Kala sooc weedhahan soo socda midda runta ah iyo midda beenta ah.

| | | | |
|-------------------------------------|---|---|--|
| b 1 waxay haysataa hal isir. | t Tiro walba oo idil kana weyn 1 ugu yaraan waxay leedahay hal isir. | j Tiro kasta oo idil waxay leedahay ugu yaraan hal isir. | |
|-------------------------------------|---|---|--|
- 3 Kuwan soo socda kuwee baa ah tirooyin mutuxan?
7, 9, 17, 27, 31, 49, 75, 83, 19, 29, 39, 43, 56, 61, 73, 87
- 4 Qor dhammaan tirooyinka mutuxan ee u dhexeeya 15 iyo 50.
- 5 Raadi isirada tirooyinkan soo socda.

| | | | |
|------------|-------------|-------------|-------------|
| b 9 | t 19 | j 90 | x 60 |
|------------|-------------|-------------|-------------|
- 6 Kala sooc tirooyinkan soo socda mid walba in ay tahay tiro mutuxan, farcan ama midnaba.

| | | | |
|---------------|---------------|-------------|--------------|
| b 13 | t 27 | j 96 | x 23 |
| kh 0 | d 37 | r 1 | s 177 |
| sh 233 | dh 507 | | |
- 7 Raadi isireynta tirooyinkan mutuxan ee soo socda

| | | | | |
|-------------|-------------|-------------|-------------|---------------|
| b 25 | t 36 | j 80 | x 72 | kh 117 |
|-------------|-------------|-------------|-------------|---------------|
- 8 Ku cadee tirooyinkan soo socda isireynta mutuxan hadey suurto gal tahay ku qor midwalba

| | | | |
|--------------|-------------|-------------|--------------|
| b 18 | t 21 | j 32 | x 40 |
| kh 48 | d 72 | r 81 | s 100 |

2.2.3 Isirada Lawadaago

Casharkan dhexdiisa waxaad ku baran sida loo helo isirada tirade idil. Bal aan eegno tusaalooyinka soo socda si ay kaaga caawiyaan xusuusinta waxa aad horey u soo dhigatay.

Tusaale 4: Tax isirada 16.

Furfuris: Sababtoo ah $1 \times 16 = 16$, 1 iyo 16 waa isirada 16.

Sababtoo ah $2 \times 8 = 16$, 2 iyo 8 waa isirada 16.

Sababtoo ah $4 \times 4 = 16$, 4 waa isirka 16.

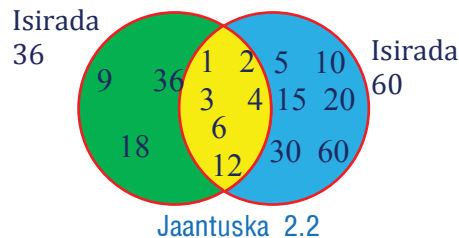
Sidaa awgeed, isirada 16 waa 1, 2, 4, 8 iyo 16.

Cashirka 2.2.3. waxaad ku baran doontaa sidii aad u sooci lahayd isirada ay wadaagaan labo ama saddex tirooyinka idil ee leh hal ama labo god. Bal hadda fiiri isirada tirooyinka 36 iyo 60.

Isirada 36: 1, 2, 3, 4, 6, 9, 12, 18, 36

Isirada 60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

Kadib, istic maal jaantuska feen (jaantus 2.2) si aad u heshid isirada ay wadaagaan 36 iyo 60.



Ogsoonaw in 1, 2, 3, 4, 6, iyo 12 ay yihiin isirada 36 iyo 60.

Isirweynaha ay wadaagaan (I.W.W) 30 iyo 60 waa 12

Waxaan u dhigi karnaa talaabooyinka kore sidan hoos ku xusan.

Si aan u helno Isirweynaha ay wadaagaan labo ama saddex tirooyinka idil.

- 1 Tax dhammaan isirada tiro kaste.
- 2 Calaamadee isirada ay wadaagaan taxii kaste.
- 3 Dooro isirka u weyn ee ay wadaagaan.

Tusaale 5: Raadi Isir weynaha ay wadaagaan 12, 54 iyo 90.

Furfuris: Si aad u heshid isir weynaha ay wadaagaan (I.W.W) 12, 54 iyo 90,

- 1 Tax dhammaan isirada tiro kasta

Isirada 12: 1, 2, 3, 4, 6, 12

Isirada 54: 1, 2, 3, 6, 9, 18, 27, 54

Isirada 90: 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90

2 Calaamad u yeel isirada ay wadaagaan sida kor lagugu tusay:

Isirada ay wadaagaan 12, 54 iyo 90 waa 1, 2, 3 iyo 6.

3 Qor isir weynaha ay wadaagaan: 6

Sidaa darteed, isir weynaha ay wadaagaan 12, 54 iyo 90 waa 6.

Qeexid 2.2: labo tiro waxaa la odhan karaa markii la isu aaneeyo wey mutuxan yihiin, haddii ayna lahayn wax ay wadaagaan waxaan ka'ahayn 1.

Tusaale 6: Tirooyinka 14 iyo 15 waa mutuxan isu aaneyntoodu sababtoo ah

$$14 = 2 \times 7 \text{ iyo } 15 = 3 \times 5$$

Laylis 2.5

1 Raadi I.W.W mid walba oo ka mid ah tirooyinkan lamaanaha ah.

b 21, 28 **t** 24, 48 **j** 63, 84 **x** 60, 80

2 Raadi I.W.W mid walba oo ka mida tirooyinkan saddaxan.

b 24, 36, 42 **t** 36, 15, 45 **j** 35, 49, 84 **x** 36, 72, 90

3 Qor saddex tiro oo I.W.W(isir waynaha ay wadaagaan) uu yahay 5.

4 Tirooyinka 12 iyo 15 ma tiroyin mataxanbaa? Sharaxaad kabixi

2.2.4 Dhufsanayaasha ay wadaagaan

Xusuusnaw: cashirka 2.2.1 ee ahaa tiro lagu siiyay dhufsanayaasheedu waxaa lagu heli karaa iyada oo tiro kasta lagu dhufanayo tiro idil.

Tan kale xusuusnaw 0 in ayna noqonin qeybshe.

Cuttub - hoosaadkani, waxaad ku baran doontaa sida loo sooco dhufsanaha ay wadaagaan labo ama saddex tiro idil lehna hal ama labo god.

Qeexid 2.3: Dhufsanaha ay wadaagaan waa tiro noqota dhufsanaha labada tirooyinba ama in ka badan.

Tusaale 7: Raadi ururka dhufsanayaasha tirooyinka idil ee 10 iyo 8.

Furfuris:

Dhufsanayaasha 10: {0, 10, 20, 30, 40, 50, 60, 70, 80, ...}

Dhufsanayaasha 8: {0, 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, ...}

Ebar waa dhufsanaha tiro walba. Sidaa awgeed; 0, 40, 80,...waa dhufsanayaasha ay wadaagaan 10 iyo 8. Laakiin markii aan ka hadleyno dhufsanaha yar ay wadaagaan tirooyinku waxaynu ujeednaa waxa aan ka'ahayn Eber.

Sidaa awgeed, dhufsanaha yare ee ay wadaagaan (DH.Y.W) 10 iyo 8 waa 40. Xusuusnaw DH.Y.W tiro aan ahayn eber.

Dhufsanaha yaraha ay wadaagaan labo ama in ka badan oo tirooyinka idil waa;

- 1 Tiro tirsiiimo ee ugu yare ee ah dhufsanaha tiro walba idil, ama
- 2 Tiro tirsiiimo ee ugu yare ee qeybisa tiro kasta oo idil hadhaa la'aan.

Tusaale 8: Raadi DH.Y.W 12 iyo 18

Furfuris: Si aan u helno DH.Y.W 12 iyo 18:

- 1 Tax dhufsanayaasha tiro kasta

Dhufsanayaasha 12: 0, 12, 24, 36, 48, 60, 72, 84, 96, 108, 120,...

Dhufsanayaasha 18: 0, 18, 36, 54, 72, 90, 108, 126,...

- 2 Tax dhufsanayaasha eber mooye inta kale ee ay wadaagaan:
36, 72, 108,

Sidaa awgeed, DH.Y.W 12 iyo 18 waa 36.

Tusaale 9: Raadi DH.Y.W 8, 9 iyo 12:

- 1 Tax dhufsanayaasha tiro walba

Dhufsanayaasha 8: 0, 8, 16, 24, 32, 40, 48, 56, 64, 72, 80,...

Dhufsanayaasha 9: 0, 9, 18, 27, 36, 45, 54, 63, 72, 81, 90,...

Dhufsanayaasha 12: 0, 12, 24, 36, 48, 60, 72, 84, 96, 108, 120,...

- 2 Tax; Eber mooyaane wixii kale ee ay wadaagaan; 72, 144...

Sidaa darteed, DH.Y.W 8, 9 iyo 12 waa 72.

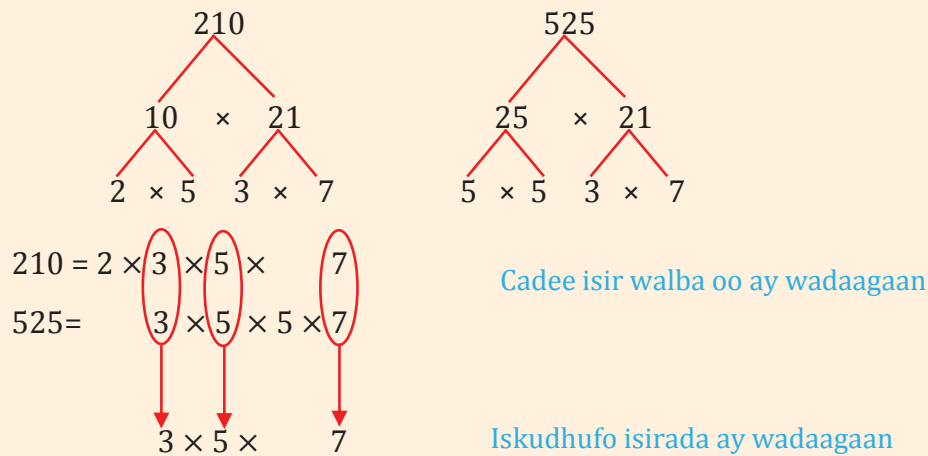
Waxaa ku xiga oon eegeynaa sida loo soo saaro tirooyinka isireynta mutuxan si loo helo I.W.W iyo DH.Y.W labo ama saddex tirooyinka idil.

Si loo helo I.W.W tirooyinka ururka

- 1 Qor isireynta mutuxan ee tiro kasta.
- 2 Kala sooc dhammaan isirada mutuxan ee ay wadaagaan.
- 3 Raadi taranta tirooyinka mutuxan ee ay wadaagaan.

Tusaale 10: Raadi I.W.W 210 iyo 525 adoo isticmaalaya isireynta mutuxan.

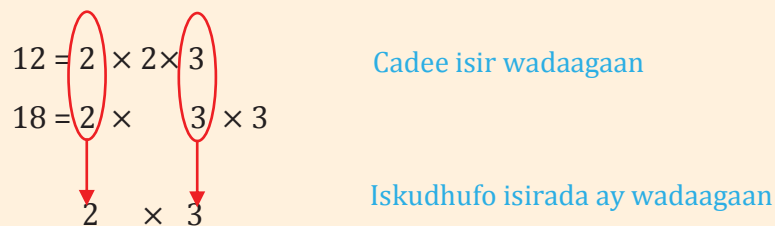
Furfuris:



Isirada mutuxan ee ay wadaagaan 210 iyo 525: 3, 5, 7.

Sidaa darteed, I.W.W 210 iyo 525 waa $3 \times 5 \times 7 = 105$.

Tusaale 11: Raadi I.W.W 12 iyo 18 adoo isticmaalaya isireynta mutuxan.

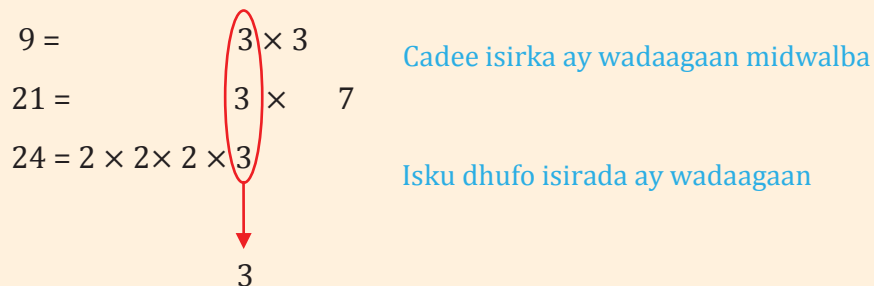


Isirada mutuxan ee ay wadaagaan 12 iyo 18: waa 2 iyo 3

Sidaa darteed, I.W.W 12 iyo 18 waa $2 \times 3 = 6$.

Tusaale 12: Raadi I.W.W. 9, 21, iyo 24 adoo isticmaalaya isireynta mutuxan.

Furfuris:



Isirka mutuxan ee ay wadaagaan 9, 21 iyo 24 waa 3.

Sidaa darteed, I.W.W 9, 21, iyo 24 waa 3.

Si aan u helno I.W.W labo ama in ka badan oo tirooyinka tirsiiimo ah Adoo isticmaalaya isireynta mutuxan:

- 1 Ku qor tiro walba qaabka isireynta mutuxan.
- 2 Sooc isirada ay wadaagaan isirka mutuxan ee lagu siiyay wuxuu noqon karaa mid lawadaago in ka badan mar.
- 3 Raadi taranta isirada mutuxan ee ay wadaagaan. Soo qaado isirka ay wadaagaan ka u muuqda tirada noq-noqodkiisu in uu ugu yar yahay.

Sidoo kale, waxaad u isticmaali kartaa isireynta mutuxan si aad u heshid DH.Y.W tirooyinka, dhufsanaha ay wadaagaan wuxuu ka kooban yahay dhammaan isirada mutuxan ee tiro walba oo ku jira urur. DH.Y.W wuxuu ka kooban yahay qeybshe walba tirada ugu jibaarane badan ee ka dhex muuqata ururka tirada.

Tusaale 13: Raadi DH.Y.W 12 iyo 18 adoo isticmaalaya isireynta mutuxan.

Furfuris:

$$\begin{array}{l} 12 = 2 \times 2 \times 3 \\ 18 = 2 \times 3 \times 3 \end{array}$$

Cadee qeybshe walba oo ay wadaagaan iyo qeybshe yaasha kalaba

Isku dhufo dhammaan qeybshe yaasha, adoo qaadanaya tirada ugu jibaarane badan.

Sidaa darteed, DH.Y.W tirooyinka 12 iyo 18 waa $2 \times 2 \times 3 \times 3$, ama $2^2 \times 3^2 = 36$.

Tusaale 14: Raadi DH.Y.W tirooyinka 9, 21 iyo 24 adoo isticmaalaya isireynta mutuxan.

Furfuris:

$$\begin{array}{l} 9 = 3 \times 3 = 3^2 \\ 21 = 3 \times 7 = 3 \times 7 \\ 24 = 2 \times 2 \times 2 \times 3 = 2^3 \times 3 \end{array} \left. \vphantom{\begin{array}{l} 9 \\ 21 \\ 24 \end{array}} \right\} \begin{array}{l} \text{Jibaaranaha ugu weyn ee 2 waa } 2^3 \\ \text{Jibaaranaha ugu weyn ee 3 waa } 3^2 \\ \text{Jibaaranaha ugu weyn ee 7 waa } 7^1 \end{array}$$

Sdaa darteed, DH.Y.W 9,21 iyo 24 waa $2^3 \times 3^2 \times 7 = 504$.

Laylis 2.6

- 1 Raadi Isirada mutuxan ee tirooyinkan soo socda.

| | | | | | | | |
|-----------|-----|-----------|-----|----------|-----|----------|-----|
| b | 56 | t | 84 | j | 72 | x | 210 |
| kh | 306 | d | 150 | r | 510 | s | 330 |
| sh | 252 | dh | 126 | | | | |
- 2 Raadi I.W.W tirooyinkan lamaan adoo isticmaalaya isireynta mutuxan.

| | | | | | |
|----------|--------|-----------|---------|----------|--------|
| b | 21, 28 | t | 68, 102 | j | 60, 80 |
| x | 27, 54 | kh | 63, 84 | | |
- 3 Raadi I.W.W tirooyinkan urur kaste adoo isticmaalaya isireynta mutuxan.

| | | | | | |
|----------|--------------|----------|------------|----------|-------------|
| b | 24, 36, 42 | t | 35, 49, 84 | j | 45, 105, 75 |
| x | 90, 252, 630 | | | | |
- 4 Waa maxay I.W.W $2 \times 3^2 \times 5^2$ iyo $2^3 \times 3 \times 5^2$?
- 5 Sideen u sheegi karnaa inaga oo fiirineyna oo keli ah in ay labo tirooyin ay yeelanayaan qeybshaha 3?
- 6 Qor saddex tirooyin oo I.W.W uu yahay 5.
- 7 Raadi DH.Y.W tirooyinkan lamaan ee soo socda adoo isticmaalaya isireynta mutuxan.

| | | | | | | | |
|----------|--------|----------|--------|----------|--------|----------|--------|
| b | 12, 16 | t | 20, 50 | j | 16, 24 | x | 15, 18 |
|----------|--------|----------|--------|----------|--------|----------|--------|
- 8 Raadi DH.Y.W tirooyinka urur kasta adoo isticmaalaya isireynta mutuxan.

| | | | | | | | |
|----------|---------|----------|-----------|----------|------------|----------|------------|
| b | 2, 7, 8 | t | 8, 28, 30 | j | 35, 25, 49 | x | 68, 170, 4 |
|----------|---------|----------|-----------|----------|------------|----------|------------|
- 9 Waa markee marka uu DH.Y.W labo tiro uu noqdo mid ka mid ah labada tiro?
- 10 Waa markee marka uu DH.Y.W labo tiro uu noqdo taranka labada tiro?
- 11 Aamina waxay rabtaa in ay goyso labo sagxadood si ay uga sameyso kabadho. Sagxadaha midkood dhererkiisu waa 72 iyo kan kalana dherarkiisu waa 54. Aamina waxay rabtaa kabadhadu in ay isku dherer ahaadaan, iyadu ma dooneyso in ay wax alwaax ah ka khasaaro.

| | |
|----------|---|
| b | Waa maxay kabadhka ugu dherer badan? |
| t | Imisa kabadho ay Aamina lahaan doontaa? |
- 12 Labo basaska caasimada Addis-Ababa ah ay isku mar ka anbabaxay saldhiga markaato iyo kadib waxay gaadheen saldhig iyaga oo ku kala tagay daqiiqadaha 12 iyo 18. Imisa daqiiqooyin kadib ayay basasku hadana ay kulmi doonaan?
- 13 Saddex ganbaleel oo kala ah B1, B2, B3 ayaa kala dhawaaqay 6,9, iyo 12 sikino sida ay isugu xig-xigaan. Imisa sikino kadib ayay mar kale wada dhawaaqayaan?

Hubin

| | |
|--|--|
| <ul style="list-style-type: none"> → Dhufsanayaasha → Dhufsane yaraha lawadaago (DH.Y.W) → Isir weynaha lawadaago (I.W.W) → Isirada iyo Dhufsanayaasha → Isireynta Mutuxan → Tirooyinka Farcan → U qeybsanaanta → Wadarta/Faraqyada qeybsanaanta → Xidhiidhka mutuxan | <ul style="list-style-type: none"> → Dhufsanayaasha lawadaago → Habka Isireynta → Isirada → Isirada lawadaago → Taranada qeybsanaanta → Tirooyinka Mutuxan → U qeybsanaanta tirooyinka idil → Xeerarka/Tijaabooyinka → qeybshayaasha kala ah 2, 3, 4, 5, 6, 8, 9 iyo 10 |
|--|--|

Soo Koobida Cutubka

| 1 | <i>Tijaabooyinka Qeybsanaanta</i> | <i>Tusaalooyinka</i> |
|----|---|---|
| 2: | Haddii booska godka koowaadku uu yahay 0, 2, 4, 6, ama 8 taas oo ah tirada dhaban | 1,294: hal godluhu 4 waa dhaban. |
| 3: | Haddii wadarta gododku ay u qeybsanto 3 | 405: $4 + 0 = 4$ iyo 636: $6 + 3 + 6 = 15$; $1 + 5 = 6$ Taas oo si cad ugu qeybsanta 3. 16, 497: $1 + 6 + 4 + 9 + 7 = 27$; $2 + 7 = 9$, taas oo si cad ugu qeybsanta 3 |
| 4: | Haddii labada god ee ugu danbeysa tirada ay u qeybsanto 4. | 40832: 32 waxay u qeybsantaa 4. ($32 \div 4 = 8$) |
| 5: | Haddii hal godluhu uu yahay 0 ama 5. | 495: hal godluhu waa 5 |
| 6: | Haddii u qeybsamo 2 iyo 3 | 1,458: $1 + 4 + 5 + 8 = 18$, sidaa darteed, waxay u qeybsantaa 3 iyo godka u danbeeyana ee ah 8 waa dhaban; sidoo kale, tiradu waxay u qeybsantaa 6. |

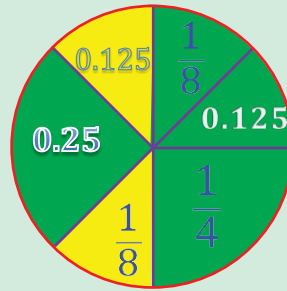
| | |
|--|---|
| 8: Haddii saddexda god ee ugu danbeysa tirada ay u qeybsanto 8 | 34152: 152 waxay u qeybsantaa 8. ($152 \div 8 = 19$) |
| 9: Haddii wadarta gododku ay u qeybsanto 9. | 2,880: $2 + 8 + 8 + 0 = 18$; $1 + 8 = 9$, taas oo si cad ugu qeybsanta 9. |
| 10: Haddii booska hal godluhu uu yahay 0. | 130: booska hal godluhu waa 0. |

- 2 Dhufsane waa tiro ka tarantay tiro idil. Tirooyinka la isku dhufanayo waxaa Ladhahaa isiro ama qeybsheyaal.
(Tusaale: $6 \times 7 = 42$, 42 waa dhufsanaha 6 iyo 7, meesha 6 iyo 7 ay ka yihiin qeybsheyaasha 42).
- 3 Tiro mutuxan waa mid leh labo isiro, hal iyo isaga laftiisa.
(Tusaale: 11 waa tiro mutuxan sababtoo ah wuxuu leeyahay labo isiro oo keli ah, 1 iyo 11).
- 4 Tiro farcan waa mid leh isiro kabadan labo.
(Tusaale: 12 waa tiro farcan sababtoo ah waxay leedahay isiro kabadan labo, 1, 2, 3, 4, 6 iyo 12).
- 5 Tirooyinka 0 iyo 1 ma aha tiro mutuxan iyo mid farcan toona.
- 6 Haddii labo tirooyin aynan wadaagin wax qeybsheyaal ah waxaan ka'ahayn 1, tirooyinka waxaa la dhahaa xidhiidhka mutuxan.
(Tusaale: 14 iyo 15 waa xidhiidhka mutuxnaanta).
- 7 Isir weynaha ay wadaagaan tirooyinka labo ama in kabadan waa tirada ugu weyn kaas oo ah qeybshaha ay wadaagaan tirooyinku.
- 8 Habka tirada loogu qoro sida tarankooda isirada waxaa la dhahaa isireynta. Markii tiro lagu sifeeyo taranka isirada mutuxan, waxaa loogu yeedhaa isireynta mutuxan ee tirada.
(Tusaale: Isireynta mutuxan ee 12 waa $2 \times 2 \times 3 = 2^2 \times 3$)
- 9 Dhufsane yaraha ay wadaagaan (DH.Y.W) tirooyinka labo ama in kabadan waa tirada ugu yare ee aan ahayn ebar ee ay wadaagaan tirooyinku. (Tusaale: DH.Y.W 10 iyo 8 waa 40).

Layliska Nakhtiinka Cutubka 2^{aad}

- 1 Qor dhufsanayaasha 15 kuwaas oo ka yar 70.
- 2 **b** Qor dhammaan qeybsheyaasha (i) 9 (ii) 13
t Tirooyinka lagu siiyay keebaa tiro mutuxan ah?
- 3 Weedhahan soo socda keebaa ah run? Keebaana ah been?
b 5 waa isirka 56. **x** 1 waa isirka 17.
t 23 isaga ayaa isu ah isir. **j** 0 waa isirka 5.
- 4 Qor dhammaan tirooyinka mutuxan ee u dhaxeeya 20 iyo 30.
- 5 Go'aami weedhahan soo socda in ay yihiin run ama been. Sabab u yeel.
b 2 waa isirka $12 + 36$. **t** 7 waa isirka 14×28 .
- 6 **b** Jeegaree qeybsamida
i 11128 loo qeybiyay 4 **ii** 1254 loo qeybiyay 6
t Sabab u yeel.
- 7 U qor mid walba oo ka mid ah tirooyinka soo socda qaabka isireynta mutuxan. Mid walba ku muuji isireynta mutuxan adoo isticmaalaya tidica jibaaranaha, hadey suurto gal tahay.
b 42 **t** 24
- 8 Raadi I.W.W midwalba oo ka mid ah tirooyinkan lamaan ee soo socda.
b 12 iyo 28 **t** 18 iyo 25
- 9 Raadi D.Y.W midwalba oo ka mid ah tirooyinkan lamaan ee soo socda
b 9 iyo 12 **t** 16 iyo 48 **j** 3 iyo 5
- 10 Waxaa lagu siiyay
A = ururka dhufsanayaasha 4 ee ka yar 10 iyo
B = ururka isirada 8, ka jawaab kuwan soo socda.
b Tax dhammaan xubnaha
i Ururka A **ii** Ururka B
t Ururka A hormo urur ma u yahay B? ku muuji jawaabahaada adoo isticmaalaya calaamado.

CUTUBKA 3aad



JAJABYO IYO JAJAB TOBANLEYAAL

Maxsuulka Cutubka:

Cutubkan dabadii, ardaydu waxay awoodi doontaa;

- *fahamka jajabyada iyo jajab-tobanleyaasha iyo rumeynta in ay yihiin laba hab oo loo muujiyo tirooyin isku mid ah*
- *kobcinta xirfaddahooda ku saabsan isbarbardhigidda horsanaanta, isugeynta, kalagoynta.*
- *iskudhufashada iyo isuqaybinta jajabyada iyo jajab tobanleyaasha*
- *ka shaqaynta masalooyinka iyo weedh-xisaabeedyada ku saabsan jajabyada iyo jajab-tobanleyaasha.*

Tusmooyinka ugu muhiimsan:

3.1 Fududaynta Jajabyada

3.2 Isku beddelidda jajabyada, jajab-tobanleyaasha iyo Boqollayda

3.3 Is-garab-dhigga iyo hormaynta jajabyada

3.4 Isu-gaynta iyo kala goynta jajabyada iyo jajab-tobanleyaasha

3.5 Isku-dhufashada iyo isu-qaybinta jajabyada iyo jajab-tobanleyaasha.

Hubin

Soo koobid

Layliska nakhtiinka ah

HORDHAC

Fasaladiinii 4^{aad} iyo 5^{aad}, waxaad ku soo barateen jaadadka kala duwan ee jajabyada, hormaynta (tixbiidda) iyo is-garab-dhigga jajabyada, waxaa kale oo aad ku soo barateen ka shaqaynta jajabyada iyo jajab-tabanleyaasha.

Cutubkani waxaad ku baran doontaan

- ◆ Sida loo fududeeyo jajabyada iyada oo la adeegsanayo qaybiyaha ugu weyn ee ay wadaagaan (**IWW**).
- ◆ Sida jajabyada iyo jajab-tabanleyaasha loogu rogo boqolley.
- ◆ Sida boqolley loogu rogo jajabyo ama jajab-tabanleyaal.
- ◆ Sida jajabyada la isu-garab-dhigo iyo sida loo hormeeyo.
- ◆ Sida jajabyada iyo jajab-tabanleyaasha loogu kala adeegsado xisaab-fallada kala ah, isu-gaynta, kala goynta, isku dhufashada iyo isu-qaybinta.

Shaqo Kooxeedka 3.1

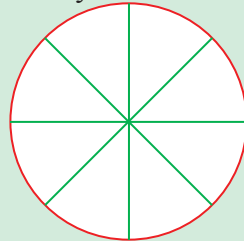
1 Soo qaado xabbad liin ah, isla markaana liinta u qaybi afar qaybood oo isle'eg, qaybaha afarta ahi u kala qaybi oo kala sii afar arday.

b Sideed u tibaaxi kartaa saami-wadaagga ardaydaada?

t Waa intee saami-wadaagga arday kasta? Ma odhan karnaa mid kasta waxaa uu helayaa 1? Ma odhan karnaa mid kasta oo ka mid ah ardayda waxaa uu helay hal-afraad?

j Adiga oo adeegsanaaya tirooyin side ayaad u tibaaxi kartaa saami-wadaagga arday kasta, oo ka mid ah ardaydaada?

2 Dib (u fiiri) labada tallabo ee r iyo s .



Jaantuska 3.1

b Imisa waaxood oo isle'eg ayey goobadu u qaybsan tahay?

t Waax kasta oo ka mid ah waaxaha ku tibaax tirooyin?

j Hadhee $\frac{1}{8}$ - ka ee jaantuska ah

- x** Hadhee $\frac{2}{8}$ ka ee jaantuska
- kh** Hadhee $\frac{3}{8}$ ka jaantuska ah
- d** Hadhee $\frac{4}{8}$ ka jaantuska
- r** Hadhee $\frac{6}{8}$ ka jaantuska
- s** Hadhee $\frac{3}{4}$ ka jaantuska
- sh** Hadhee $\frac{8}{8}$ ka jaantuska
- dh** Midkee baa weyn $\frac{3}{4}$ iyo $\frac{6}{8}$? (Dib u ugu noqo labada tallaabo ee s iyo sh hawshii aad ka soo qabatay).

Qeexid 3.1: Haddii “a” iyo “b” yihiin tirooyin. $b - na \neq 0$, isla markaana dhammaan loo qaybiyo qaybo isle’eg oo “b” ah, lagana qaato qaybta “a” oo ka mid ah qaybaha, kolkaa “ $\frac{a}{b}$ ” waxaa lagu magacaabaa Jajab.

“ $\frac{a}{b}$ ” waxaa loo akhriyaa “a” la hoos-dhigay “b”

Haddaba, jajabka ah “ $\frac{a}{b}$ ”, “a” waxaa lagu magacaabaa “Sarreeye”, “b” –na waxaa lagu magacaabaa “Hooseeye”.

Tusaale ahaan:

- b** Jajabka ah $\frac{1}{2}$ macnahiisu waa sidan, walax dhammaanteed ayaan u qaybinay laba qaybood oo isle’eg, islamarkaana aan ka qaadanay hal-qayb oo ka mid ah qaybaha.
- t** Jajabka ah $\frac{3}{4}$, macnahiisu waa sidan; Walax dhammaanteed ayaan u qaybinay afar qaybood oo isle’eg, isla markaana waxaan ka qaadanay Saddex-qaybood oo ka mid ah qaybaha.

Jajabyadu waa qurubyo u taagan walax dhan

Haddii Tufaax aad u qaybiso afar qaybood oo isle'eg, isla markaana aad cunto hal-qayb, kolkaa jajabka $\frac{3}{4}$ waxaa uu sharxayaa qurubyada (qaybaha) tufaaxa ah ee aan la cunin. Kolkaa wali waxaad haysataa saddex-afaraadka.

3.1 FUDUDAYNTA JAJABYADA

Cutub-hooseedkani wuxuu nabari doonaa sida jajab loogu beddelo qaab ama hab-fudud.

Hawlgalka 3.1

U fiirso jajabkan $\frac{6}{8}$

b Raadi IWW 6 iyo 8.

t Sarreeyaha jajabka u qaybi 2.

j Hooseeyaha jajabka u qaybi 2.

x Qaado jawaabta aad ka heshay sarreeyaha “b” iyo jawaabta hooseeyaha “c” isla markaana ka samee jajab cusub. Waa maxay IWW sarreeyaha iyo hooseeyaha jajabka cusub?

kh Waa maxay xidhiidhka ka dhexeeya jajabka cusub iyo jajabkii hore ee $\frac{6}{8}$?

d Guud ahaan, haddii lagu siiyey jajabka saan-saankiisu yahay $\frac{a}{b}$. $b \neq 0$,

jajabkani ma u qori kartaa saan-saanka ah $\frac{c}{d}$, $d \neq 0$ IWW $(c, d) = 1$? Qor

tallaabooyinka aad qaadayso.

Qeexid 3.2: Haddii “a” iyo “b” yihiin laba tiro IWW $(a, b) = 1$, kolkaa jajabka $\frac{a}{b}$ waxaa

lagu magacaabaa jajabka ugu tibix yar (hooseeya).

Jajabka ugu tibixda yari waa jajabka ugu saansaanka fudud (sahlan). Jajabka ugu tibix yar waxaan u qori karnaa iyada oo aan u qaybino sarreeyaha iyo hooseeyaha IWW.

Tusaale 1: Qor tibixdiisa ugu yar jajabka $\frac{6}{18}$.

Furfuris: Tallaabada – 1aad

Soo saar IWW (6,18)

Isirrada 6: 1, 2, 3, 6.

Isirrada 18: 1, 2, 3, 6, 9, 6

Isirrada ay wadaagaan 6 iyo 18: 1, 2, 3, 6.

Sidaa darteed, IWW (6, 18) = 6

Tallaabada – 2^{aad}

Sarreeyaha iyo hooseeyaha jajabka $\frac{6}{18}$ labadaba u qaybi 6, isla markaana ka samee jajab cusub.

$$\frac{6}{6} = 1 \text{ iyo } \frac{18}{6} = 3$$

Kolkaa jajabka cusub waa $\frac{1}{3}$, IWW (1, 3) = 1

Marka aan qorno jajabka $\frac{6}{18}$ tibixdiisa ugu yari, jawaabteedu waxa weeyaan $\frac{1}{3}$.

Ogaal: jajabyada $\frac{6}{18}$ iyo $\frac{1}{3}$ waxaa lagu magacaabaa jajabyo isu-dhigma.

Si aan u helno jajabyo isu-dhigma sarreeyaha iyo hooseeyaha labadaba waxaan ku dhufaneynaa ama u qeybinaynaa tiro isku mid ah.

Tusaale 2: u qor jajabkan $\frac{80}{100}$ Heerkiisa ugu Hooseeya.

Furfuris:

Tallaabadda 1^{aad}: Isirweynaha ay wadaagaan (IWW) (80, 100) = 20 sidee?

Tallaabadda 2^{aad}: u qaybi hooseeyaha iyo sareeyahaba IWW kaas oo ah 20.

$$\text{Hadaba } \frac{80 \div 20}{100 \div 20} = \frac{4}{5}$$

Qeexida 3.3: Haddii b iyo t yihiin tirooyin tirsiimo, jjabka $\frac{b}{t}$ waxaa lagu magacaabaa tirooyinka lakab ee togon. Ururka dhammaan tirooyinka lakab ee togon waxaa loo qoraa \mathbb{Q}^+ , waxaana loo Qeexaa

$$\mathbb{Q}^+ = \left\{ \frac{b}{t} : b, t \in \mathbb{N} \right\}, \text{ Halka } \mathbb{N} \text{ ay tahay ururka tirooyinka Tirsiimo}$$

Laylis 3.1

1 Jajabyada soo socda qor tibxahooda ugu yar

| | | | | | | | |
|------|-----------------|-----|--------------------|-----|-----------------|-----|-----------------|
| b | $\frac{8}{10}$ | t | $\frac{14}{12}$ | j | $\frac{18}{24}$ | x | $\frac{48}{60}$ |
| kh | $\frac{24}{18}$ | d | $\frac{216}{1080}$ | r | $\frac{72}{60}$ | | |

2 Sheeg ugu yaraan seddex jajab oo kala duwan oo u dhigma

| | | | |
|-----|---------------|-----|---------------|
| b | $\frac{3}{4}$ | t | $\frac{1}{2}$ |
|-----|---------------|-----|---------------|

3 Jajabyadan soo socda keebaa u qoran heerkiisii ugu hooseeyey? Sharax sababta?

| | | | | | |
|-----|-----------------|------|-----------------|-----|----------------|
| b | $\frac{2}{3}$ | t | $\frac{18}{24}$ | j | $\frac{6}{7}$ |
| x | $\frac{10}{20}$ | kh | $\frac{5}{4}$ | d | $\frac{6}{30}$ |

3.2 ISKU BEDELLIDDA JAJABYADA, JAJAB – TOBANLEYAASHA IYO BOQOLLEYAASHA

Cuttub-Hoosaadkii Hore, Waxaad ku soo Aragteen, sida loo Fududeeyo jajabyada. Cuttub hoosaadkana, waxaad ku arki doontaan sida jajab loogu bedelo jajab – tobanluhu ay yihiin kuwo aan dhammaan waxaa lagu soo ururin laba ama seddex-god jajab-tobanlayaashu sidoo kale waxaa loo bedeli karaa jajab iyo Boqolkiiba, sidaa si ka soo horjeeda ayaad sidoo kale ugu bedeli kartaa boqolkiiba jajab iyo jajab-tobanle.

3.2.1 Jajabyada oo loo bedelayo jajab – tobanle iyo boqollay

Jajabku waa tiro inaga caawisa si aan cadayno qeybi intay ka tahay wax idil. Tiro Nooc kale oo inaga caawisa sidaan u caddayn lahayn qeybi intay ka tahay wax idil waa jajab - tobanlaha.

Hawlgalka 3.2

U Bedel jajabyadan soo socda jajab-tobanle (Isticmaal qeybta dheer).

| | | | | | | | | | |
|----------|---------------|----------|---------------|----------|---------------|----------|----------------|-----------|----------------|
| b | $\frac{1}{2}$ | t | $\frac{3}{4}$ | j | $\frac{2}{5}$ | x | $\frac{8}{13}$ | kh | $\frac{22}{7}$ |
|----------|---------------|----------|---------------|----------|---------------|----------|----------------|-----------|----------------|

Tusaale 1: Aan qaadano tirada tirsiiimo ee 234. Haddii aan dhigno Barta “Meel u dhaxaysa godadka, tiradani waxay noqon jajab-toobanle. Tusaale ahaan 2.34, waxaa loo Akhriyaa laba dhibic seddex-afar, waana tiro jajab-tobanle ah. Barta aan dhigno godadka dhexdeeda waxaa la dhahaa Barta jajab-tobanlaha.

Ku soo ururinta barta jajab-tobanlaha

Ku soo ururinta waa hab lagu qiyaaso tiro ta ugu dhaw taasoo ka yar ama ka badan. Ku soo ururinta Barta jajab-tobanle ay ka yar yihiin tirada Barta dhibicda ka dambeysaa kii hore.

Inagoo daadinayna dhammaan Godadka kale ee midigta ka xigga godka labaad ee marka laga bilaabo barta jajab tobanlaha dabadeed.

Haddaba, si aan ugu soo koobno laba God barta jajab tobanlaha Dabadeed waxaa fiirinaynaa Godka seddexaad ee barta jajab tobanlaha dabadeed.

- Haddii Tirada Godka seddexaad ee Barta jajab tobanlaha dabadeed ahi ay tahay 0, 1, 2, 3 ama 4 ha badalin labada god ee ka dambeeya barta jajab tobanlaha sidooda ha ahaadaan inta kalena daadi.
- Haddii tirada Godka seddexaad ee jajab tobanlaha dabadeed ay tahay 5, 6, 7, 8 ama 9 kordhi (kudar) hal Godka labaad ee barta jajab toban laha dabadeed inta kalena daadi.

Si loogu soo kobo (ururiyo) Barta jajab tobanlaha Dabadeed seddex God

- Haddii tirada godka 4^{aad} ee Barta jajab tobanlaha Dabadeed ay tahay 0, 1, 2, 3, ama 4 sidooda ku daa seddexda God ee barta jajab to banlaha dabadeed inta kalena daadi.
- Haddii tirada Godka 4^{aad} ee Barta jajab tobanlaha dabadeed ay tahay 5, 6, 7, 8 ama 9. Ku kordhi Godka 3^{aad} ee Barta jajab tobanlaha Dabadeed 1, inta kale ee ka dambeysa Godka 3^{aad} na iska daadi.

Tsaale 2: Ku soo ururi 3.5864 laba god barta jajab tobanlaha dabadeed.

Furfuris: Godka 3^{aad} ee Barta jajab tobanlaha dabadeed waa 6 taasoo ka weyn 5. Waxaan u geyneynaa 1 tirada 8 inta kale ee Godka labaad ka dambeysana weynu daadin.

Sidaas darteed 3.5864 waxay ku soo ururi 3.59 laba God barta jajab tobanlaha dabadeed.

Tusaale 3: ku soo ururi 2.673462 saddex god barta jajab tobanlaha dabadeed.

Furfuris: Godka 4^{aad} ee Barta jajab tobanlaha dabadeed waa 4 kaas oo ka yar 5 Dabadeed weynu daadin tirooyinka 3 midig ka xiga oo dhan. Sidaas darteed, 2.673462 waxaa lagu soo ururin 2.673 saddex god barta jajab tobanlaha dabadeed.

Waxaa ee jira laba hab kaasoo loogu badalo jajabka jajabtobanleyaal

Habka 1: U qor jajabyada lagu siiyey mid Hooseeyihiisu yahay 10,100,1000 iwm Adigoo ku dhufanaya isir ku haboon Dabadeedna u bedel jajabtobanle.

Tusaale 4: u Bedel $\frac{3}{5}$ jajab tobanle.

Furfuris : $\frac{3}{5} = \frac{3 \times 2}{5 \times 2} = \frac{6}{10} = 0.6$

Tusaale 5: u Bedel $\frac{7}{20}$ jajab robanle

Furfuris: $\frac{7}{20} = \frac{7 \times 5}{20 \times 5} = \frac{35}{100} = 0.35$

Habka 2: Waxaan isticmaalaynaa qeybta dheer, taasoo aan isuqeybinayno sareeyaha iyo hooseeyaha.

Tusaale 6: U bedel $\frac{2}{5}$ jajab tobanle

Furfuris: Si loogu bedelo jajab, jajab tobanle, waxaan isticmaaleynaa qeybinta dheer.

$$\begin{array}{r} 0.4 \\ 5 \overline{) 20} \\ \underline{20} \\ 00 \end{array}$$

$$\text{Hadaba, } \frac{2}{5} = 0.4$$

Ogow in qeybintan aan helnay hadhaa eber ah.

Tusaale 7: u bedel jajabkan $\frac{2}{6}$ jajab tobanle.

$$\begin{array}{r} 0.3333\dots \\ 6 \overline{) 20} \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \\ \cdot \\ \cdot \\ \cdot \end{array}$$

Qeybtan dheer, hadhaagu waligii Eber ma noqonayo, waxaa si soo noqnoqosho leh u heleynaa hadhaaga 2. Isuqeybintu ma dhammaanayso.

Haddaba, $\frac{2}{6} = 0.333\dots$ marka aan ku soo ururino laba god

$$\frac{2}{6} = 0.33$$

Jajabyada noocan ah ee leh godadka aan dhammaan ee barta jajab tobanlaha Dabadeed waxaa la dhahaa jajab tobanlayaasha aan dhammaan ee soo noqnoqda.

Qeexida 3.4: Jajabtobanlayaasha tiro god oo go barta jajab tobanlaha dabadeed waxaa la dhahaa jajabtobanlaha dhammaada.

Qeexida 3.5: Jajabtobanlayaasha aan godadka ka dambeeya barta jajab tobanluhu dhammaanin waxaa la dhahaa jajab tobanlayaasha aan dhammaan.

Tusaale 8:

- i** 0.234 waa jajabtobanle dhammaada
- ii** 0.666... waa jajabtobanle aan dhammaan
- iii** 1.22661 waa jajabtobanle dhammaada.

Jajabtobanleyaasha Godadka ka dambeeya Barta jajab tobanluhu waxay leeyihiin qiime rugeedyo Godka ku xigga Barta jajab tobanlaha waxaa la dhahaa hal-tobanad, Godka ku xiggaana waa halboqlaad, hal-kumaad iwm.

Tusaale ahaan, jajabtobanlaha 0.234, 2waxay ku jirtaa Godka hal-tobnaadka, 3na Godka hal-Boqlaad, 4-na Godka hal kumaad.

Hawlgalka 3.3

- 1 Si koox ahaaneed u falanqeeya macnaha boqolley isla markaana u sharxa fasalka. Waa maxay sumadda baqolley?
- 2 Jajabyada soo socda u roga boqolley isla markaana tibaaxa idinka oo adeegsanaya sumadda boqolley.

$$\mathbf{b} \quad \frac{1}{2} \qquad \mathbf{t} \quad \frac{1}{4} \qquad \mathbf{j} \quad \frac{3}{4} \qquad \mathbf{x} \quad 1$$

Qeexid 3.6: Boqolley waa jajab hooseeyihiisu yahay 100

$$\frac{a}{100} = a\%, \text{ waxaa loo akhriyaa 'a' boqolkiiba ama boqolkiiba 'a'}$$

Tusaale 9:

$$\mathbf{b} \quad \frac{3}{100} = 3\%; \text{ Saddex boqolkiiba}$$

$$\mathbf{t} \quad \frac{14}{100} = 14\%, \text{ Afar iyo toban boqolkiiba}$$

$$\mathbf{j} \quad \frac{20}{100} = 20\%; \text{ Labaatan boqolkiiba}$$

$$\mathbf{x} \quad \frac{135}{100} = 135\%; \text{ Boqol iyo shan iyo soddon boqolkiiba}$$

Jajabka lagu siiyey si aad ugu rogto boqolley, waa inaad hooseeyaha jajabka ka dhigtaa 100.

Kolka aad sidaa samaynaysa, waxaad u baahan tahay in sarreeyaha & hooseeyaha jajabka labaduba ku dhufato isir ku haboon.

Si aad jajab tabanle ugu baddasho boqolley, jajabka lagu siiyo ku dhufo $\frac{100}{100}$.

Tusaale 10: Jajabka $\frac{1}{5}$ u rog boqolley.

Furfuris: Si aad jajabka $\frac{1}{5}$ ugu rogto boqolley. Waxaad u baahan tahay in hooseeyaha jajabka ka dhigto 100. Marka aad sidaassi samayso, waa in aanu isbeddelin jajabku. Kolkaana waa in sarreeyaha iyo hooseyaha labadaba aad ku dhufataa isir ku haboon waa $\frac{1}{5}$. Sidaas awgeed;

$$\frac{1}{5} = \frac{1}{5} \times \frac{20}{20} = \frac{20}{100} = 20\%.$$

Markaa; kolkii $\frac{1}{5}$ aad u beddeshay boqolley. Jawaabta waxa ay noqotay 20%.

Layli 3.2

1 Jajabyada soo socda u rog jajabtobanle.

| | | | | | | | |
|-----------|---------------|----------|---------------|----------|----------------|----------|-----------------|
| b | $\frac{3}{5}$ | t | $\frac{5}{2}$ | j | $\frac{5}{6}$ | x | $\frac{2}{7}$ |
| kh | $\frac{7}{3}$ | d | $\frac{1}{6}$ | r | $\frac{11}{5}$ | s | $\frac{100}{3}$ |

2 Jajabyada soo socda u bedel jajab-tabanleyaal isla markaana sug haddii jawaabta jajab-tobanlayaashu yihiin kuwo xadleh ama xadlada. Jajab-tobanleyaasha xad la-da ah wareeji saddex rugood.

| | | | | | | | |
|-----------|----------------|-----------|-----------------|----------|---------------|----------|----------------|
| b | $\frac{1}{3}$ | t | $\frac{3}{4}$ | j | $\frac{3}{8}$ | x | $\frac{2}{7}$ |
| kh | $\frac{22}{7}$ | d | $\frac{7}{3}$ | r | $\frac{5}{6}$ | s | $\frac{11}{3}$ |
| sh | $\frac{9}{10}$ | dh | $\frac{13}{15}$ | | | | |

3 Jajab-tobandeyaasha soo socda muuji qiima- rugeedka godka 3.

| | | | | | | | |
|----------|-------|----------|-------|----------|-------|----------|--------|
| b | 1.312 | t | 0.013 | j | 5.432 | x | 10.341 |
|----------|-------|----------|-------|----------|-------|----------|--------|

4 Jajabyada soo socda u beddel boqolley

| | | | | | | | | | |
|----------|------------------|----------|---------------|----------|-----------------|----------|----------------|-----------|----------------|
| b | $\frac{23}{100}$ | t | $\frac{2}{5}$ | j | $\frac{13}{50}$ | x | $\frac{12}{7}$ | kh | $\frac{8}{13}$ |
|----------|------------------|----------|---------------|----------|-----------------|----------|----------------|-----------|----------------|

3.2.2 Jajab – toban leyaasha Dhammaada oo loo bedelayo Jajabyo iyo Boqolley

Hawlgalka 3.4

- 1 Jajab-tobanleyaasha dhamaada ee soo socda u bedel jajabyo.

| | | |
|---------------|-----------------|----------------|
| b 0.5 | t 0.25 | j 0.75 |
| x 0.01 | kh 0.005 | d 0.281 |
- 2 JaJabyada sare u beddel boqolley

U beddelidda jajab-tobanleyaasha loo beddelaayo jajabyo waxa ay ku xidhan tahay in lagu dhufto ama loo qaybiyo tirooyinka 10,100,1000, 10,000 jab jab-toban leyaasha lagu siiyey. Sidaas oo kale jajabka xadka leh ee loo beddelayo boqolley waxay ku xidhan tahay in lagu dhufto ama loo qaybiyo 100 jajab – toban – laha lagu siiyey. Middana hooseeyaha ayey u beddeleysaa 100.

Tusaale 11: U fiirso jajabtobanlaha 0.12

- i Jajab – toban laha u bedel jajab
- ii Jajab – toban laha u bedel boqolley, boqolkiiba

Furfuris:

$$\begin{aligned}
 \text{i} \quad 0.12 &= 0.12 \times 1 \\
 &= 0.12 \times \frac{100}{100} = \frac{12}{100}.
 \end{aligned}$$

Marka jajabka 0.12 loo beddelo jajab, jawaabtu waa $\frac{12}{100}$.

Sidaa darted; $0.12 = \frac{12}{100} = \frac{3}{25}$ (Waayo?).

- ii U rogidda jajabka 0.12 loo beddelo boqolley.

$$\begin{aligned}
 0.12 &= 0.12 \times \frac{100}{100} \\
 &= \frac{12}{100} = 12\%
 \end{aligned}$$

Tusaale 12: Jajabka 0.145 u rog boqolley & jajab.

Furfuris: Jajabka lagu siiyey si aad ugu beddesho boqaleey, waxaad haysataa.

$$\begin{aligned}
 0.145 &= 0.145 \times \frac{100}{100} \\
 &= \frac{14.5}{100} = 14.5\%
 \end{aligned}$$

Jab jab-tobanlaha 0.145 si aad u rogto jajab, waxaad haysatay

$$0.145 = 0.145 \times \frac{100}{100} = \frac{145}{1000}$$

$$\text{Sidaa awgeed; } 0.145 = \frac{145}{1000} = \frac{29}{200} \text{ (tibixdeeda ugu hooseyso)}$$

Ogaal: Si jajab tobanlaha lagu siiyey ugu beddesho boqolley, jajab-tabanlaha lagu

siiyey waxaad ku dhufanaysaa $\frac{100}{100}$.

Shaqa Kooxeedka 3.2

Tiri wadarta ardyda ee fasalkaaga kana Jawaab su'aalaha soo socda

- b** Waa maxay tirada ardyda ee labka ah?
- t** Waa maxay tirada ardayda ee dheddigga?
- j** Ku sug jajab ahaan ardyda labka ah inta ay ka yihiin tirada guud ee ardyda?
- x** Ardayda labka ah boqolkiiba imisa ayey ka yihiin fasalkaaga?
- kh** Jajab ahaan u sug ardyda dheddigga ah intaay ka yihiin tirada guud ee fasalkaaga?
- d** Boqolkaba intee dheddig ka ah ardyda fasalkaaga?

Layli 3.3

1 Jajab-tobanleyaasha soo socda u beddel jajab.

$$\mathbf{b} \quad 0.2 \qquad \mathbf{t} \quad 0.02 \qquad \mathbf{j} \quad 0.56 \qquad \mathbf{x} \quad 0.025$$

$$\mathbf{kh} \quad 0.64 \qquad \mathbf{d} \quad 0.72 \qquad \mathbf{r} \quad 21.32$$

2 Jaja-tobanleyaasha (1) lagugu siiyey urog boqolley.

3 Dheh (sheeg) run ama been

$$\mathbf{b} \quad 0.25 = \frac{25}{100} = 25\% = \frac{1}{4} \qquad \mathbf{t} \quad \frac{1}{10} = 10\%$$

$$\mathbf{j} \quad 0.56 = \frac{14}{25} \qquad \mathbf{x} \quad \frac{7}{25} = 28\%$$

$$\mathbf{kh} \quad 0.025 = 25\% \qquad \mathbf{d} \quad 0.025 = \frac{1}{40}$$

3.2.3 U rogidda Boqolley, Jajabyo iyo Jajab-tobanleyaal

Hawlgalka 3.5

1 Boqolleyada soo socda u beddel jajabyo kasaar isla markaana u fududee jawaabta jajabyada tibixda ugu hooseysa (yar)

| | | | | | |
|----------|------|-----------|-----|----------|------|
| b | 80% | t | 95% | j | 15% |
| x | 2.5% | kh | 25% | d | 1.5% |

2 Boqolleyada soo socda u beddel jajab-tobanle.

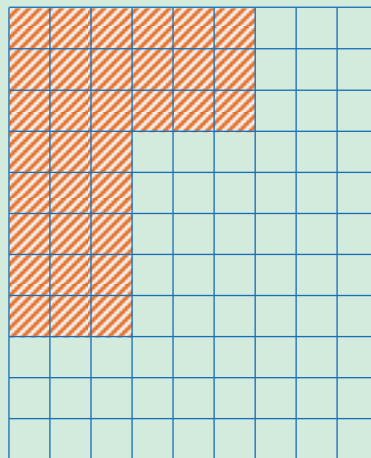
| | | | | | | | |
|-----------|-----|----------|-----|----------|-------|----------|------|
| b | 80% | t | 95% | j | 15% | x | 2.5% |
| kh | 35% | d | 5% | r | 0.24% | | |

3 Raadi 20% ee tirooyinka soo socda

| | | | | | | | |
|----------|-----|----------|----|----------|----|----------|----|
| b | 100 | t | 60 | J | 30 | x | 20 |
|----------|-----|----------|----|----------|----|----------|----|

Shaqo Kooxeedka 3.3

Eeg jaantuska hoose isla markaana ka jawaab weydiimaha soo socda



Jaantuska 3.2

- 1** Waaimisa wadarta tiro ee sanduuqyada ku jira jaantuska?
- 2** Imisa sanduuq ayaa Hadhaysan? Imisa sanduuq ayaan hadhaysnaayn?
- 3** Qor jajabka, jajab-tabanlaha iyo boqolleyada sanduuqyada hadhaysan.
- 4** Qor jajabka, jajab-tobanlalee iyo boqolleyda sanduuqyada aan hadhaaysnayn.
- 5** Jajabyadee aan soo noqnoqon, iyo kuwee soo noqnoqda?

Xusuusnow boqolleydu waa jajabyo hooseeyahoodu yahay 100. Sidaa awgeed boqolley waxaa loo qori kara? jajab & jajab-tobanle. Si boqolley loogu beddelo jajab waxaa boqolleyda loo qeybiyaa 100 isla markaana waa la fududeeyaa. Si boqolley loogu rogo jajab-tobanle, marka hore boqolleyda ayaa loo beddelaa jajab ka dibna jajabka ayaa loo roгаа jajab-tobanle.

Tusaale 13:

b 35% u rog jajab

t 35% u rog jajab-tobanle

Furfuris: **b** $35\% = \frac{35}{100}$, marka lafududeeyo jajab kani waxa uu

noqonayaa $\frac{7}{20}$

Sidaas darted $35\% = \frac{35}{100} = \frac{7}{20}$

t $35\% = \frac{35}{100} = \frac{7}{20} = 0.35$

$\begin{array}{ccc} \uparrow & \uparrow & \uparrow \\ \text{boqolley} & \text{jajab} & \text{jajab-tobanle} \end{array}$

Ogaal:

1 Haddii $a < b$, jajabka qaabkiisu yahay $\frac{a}{b}$ waxaa lagu magacaabaa jajab qumman.

2 Haddii $a > b$, jajabka qaabkiisu yahay $\frac{a}{b}$ waxaa lagu magacaabaa jajab ma-qummane ah.

3 Jajabka qaabkiisu yahay $a \frac{b}{c}$ waxaa lagu magacaabaa jajab-dhafan.

Tusaale 14:

b $\frac{3}{4}$ waa jajab qumman.

t $\frac{1}{11}$ waa jajab qumman

j $\frac{7}{6}$ waa jajab ma-qummane

x $3\frac{1}{5}$ waa jajab dhafan

Layli 3.4

1 Boqolleyada soo socda u rog jajabyo

| | | | | | | | |
|-----------|-------|----------|-----|----------|------|----------|--------|
| b | 30% | t | 12% | j | 1.2% | x | 0.07% |
| kh | 0.05% | d | 23% | r | 39% | s | 0.027% |

2 Boqolleyada soo socda u rog jajab-tobanleyaal

| | | | | | | | |
|-----------|-----|----------|------|----------|------|----------|------|
| b | 65% | t | 135% | j | 220% | x | 15% |
| kh | 60% | d | 20% | r | 66% | s | 0.6% |

3 sheeg jajabyada soo socda inay yihiin iyo in – kale. Jajab qumman, jajab ma- qummane ama jajabyo dhafan.

| | | | | | | | |
|-----------|-----------------|----------|----------------|----------|----------------|----------|-----------------|
| b | $\frac{13}{50}$ | t | $\frac{5}{2}$ | j | $\frac{12}{7}$ | x | $\frac{8}{100}$ |
| kh | $3\frac{1}{6}$ | d | $5\frac{1}{4}$ | | | | |

4 Dhammaystir tusaha hoose

| Jajab | Jajab-tobanle | Boqolley |
|-----------------|---------------|----------|
| | 0.21 | 21% |
| $\frac{13}{25}$ | | 52% |
| | | 24% |

3.3 IS-BARBAR-DHIGGA IYO HORSANAANTA JAJABYADA

Mowduuc hooseedkani, waxaad ku baran doontaan sida la isu-barbar dhigo iyo sida loo habeeyo jajabyada

Is-barbardhigidda jajabyada waxaa loo tixgelin karaa kale soocidda jajabyada weyn iyo kuwa yar yar. Habaynta jajabyada waxaa loo qaataa habka ay u kordhaan iyo sida ay a yaraadaan.

Hawlgalka 3.6

1 Midkee weyn lammaaneyaasha jajab ee lagu siiyey? Ku adeegso jawaabtaada summadaha kala ah. $<$, $>$ ama $=$.

b $\frac{4}{10}$ iyo $\frac{6}{10}$ **t** $\frac{1}{12}$ iyo $\frac{1}{10}$ **j** $\frac{1}{5}$ iyo $\frac{1}{2}$ **x** $\frac{4}{10}$ iyo $\frac{8}{10}$

2 **b** Soo qaado mastarad aad ka samaysay kartoon una kala qeybi laba qeybood oo is le'eg, u tibaax qeyb kasta adigo oo u adeegsanaya jajabyo.

| | |
|---|---|
| ? | ? |
| A | B |

A _____

B _____

t mastaradda u qaybi 3 qayb oo isle'eg isla markaana qeyb kasta jajab ahaan u tibaax.

| | | |
|---|---|---|
| ? | ? | ? |
| C | D | E |

C _____

D _____

E _____

j Qaybahee ugu wayn? Kuwa b ama t?

x Mastaradda 4 isle'eg u qeybi, qayb kastana u tibaax jajab ahaan.

| | | | |
|---|---|---|---|
| ? | ? | ? | ? |
| F | G | H | I |

F _____

G _____

H _____

I _____

kh Is-barbar-dhig kuwa aad ka heshay **b** iyo kuwo **d**. Qaybahee isku mid ah?

Kolka aad is-barbardhigto jajabyo, haddi hooseeyayaashu isku mid yihiin, kuwa sarreeyahoodu yar yahay ayaa yar.

Tusaale 1: $\frac{15}{100} < \frac{40}{100}$

Jajabyadan waxay leeyihiin hooseeye isku mid ah labaduba (100) isla markaana $15 < 40$.

Qaabka jajab-toban lana waa $0.15 < 0.40$.

Tusaale 2: $\frac{40}{100} < \frac{55}{100} < \frac{60}{100}$.

U firso jajabyada dhammaan waxa ay leeyihiin hooseeyayaal isku mid ah isla markaana midka ugu sarreeye yar ayaa ugu yar.

$40 < 55 < 60$.

Haddii hooseeyayaasha jajabyadu aanu isku mid ahayn, waxaad adeegsan kartaa xeerka guud ee soo socda.

Haddii a, b, c, iyo d ay yihiin tirooyin tirsiimo.

$$\frac{a}{b} > \frac{c}{d} \text{ haddii iyo haddii oo qudh ah}$$

$$a \times d > b \times c$$

$$\rightarrow \frac{3}{2} > \frac{2}{3} \text{ maadaama } 3 \times 3 > 2 \times 2$$

$$\Rightarrow 9 > 4$$

Marka aad is-barbar dhigayayso jajab toban layaasha, waxaad qaadataa tirada ka horreysa dhibicda, is la markaana tirada badan ee ka horreysa dhibicda ayaa tirada ugu weyn.

Haddii ay isle'eg yihiin isbarbar dhig godadka ka dambeeya una adeegso qiimaha godka.

Marka hore isbarbardhig godka qiimaha godadka tobanle. Godka tirada weyn leh ayaa ah qiimaha godka tobanlaha ah, haddii ay isku mid noqdaan isgarab – dhig, godadka boqoleyda, godka ugu weyn ayaa ah qiimaha godka boqolleyda. Haddii ay isku mid noqdaan isgarab – dhig, godadka kumaadka ah, qiimaha godka ku maadka ahna waa midka ugu tirada weyn sidaa iyo si la mid ah ku wad.

Tusaale 3: Midkee weyn 16.53 iyo 4.47

Furfuris: Si aad isbarbardhigto jajab-tobanlayaashan, waxaad isbarbardhigi tirooyinka ka horeeya dhibcaha midka wayni waa kan ka horreye dhibicda ee badan maadaama 16 kaweyn tahay 4, kolka 16.53 waxa ay ka weyn tahay 4.47.

$$\text{Taas oo ah } 16.53 > 4.47$$

Tusaale 4: midkee yar 3.51 ama 3.42?

Furfuris: Tirada ka horreysa dhibicda ee jajab tobanle walba waa 3.is-barbardhig godadka dhibicda ka dambeeye. Haddi ay isleeg yihin haltobnaad isbarbardhig godadka hal boqlaadka imika 3.51 godka hal-tobnaad ka waa 5, jajab – tobanlaha 3.42 godka tabnaadkiisuna waa 4.

Kolkaa 5 waxay ka weyn tahay 4. Sidaa awgeed; 3.42 waa ay ka yar tahay 3.51.

Hawlgalka 3.7

1 U habee jajabyadan soo socda dhanka ugu yar ila ka u weyn (Adeegso sumadda <).

b $\frac{1}{12}, \frac{1}{10}$ iyo $\frac{1}{8}$ **t** $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ iyo $\frac{1}{5}$ **j** $\frac{5}{12}, \frac{3}{4}, \frac{2}{3}$ iyo $\frac{7}{8}$

2 U habee jajabyada ka ugu weyn ilaa ugu yar (Adeegso sumada >).

b $\frac{1}{12}, \frac{1}{10}$ iyo $\frac{1}{8}$ **t** $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ iyo $\frac{1}{5}$ **j** $\frac{5}{12}, \frac{2}{3}, \frac{3}{4}$ iyo $\frac{7}{8}$

3 U habee jajab-tobahleyaasha soo socda nidaamka ay u kala yar yihiin.

b 0.3, 0.52, 0.35 **t** 0.43, 0.72, 0.8, 0.38 **j** 1.3, 2.52, 0.35, 0.36

Haddi laba ama in ka badan oo jajabyo ah lagu siinayo, marka hore isu-barbardhig ama u habee si lammaane ah dhanka ugu yar ilaa dhanka ugu weyn ama dhanka ugu weyn ilaa dhanka ugu yar marka aad jajabyo u habaynaysid sida ay u kale yar yihiin, waxaad adeegsan dheeliga ah ka yar (<), markase aad u habaynaso sida ay u kala weynyihiin, waxaad adeegsan dheeliga ah ka weeyn (>).

Tusaale 5: U habee jajabayada soo socda sida ay u kala yar yihiin $\frac{1}{3}, \frac{20}{3}, \frac{7}{3}, \frac{40}{3}$

Furfuris: Maadaama ay dhammaan jajabyadu leeyihiin hooseeyo isku mid ah, isbarbardhig sarreeyayaasha. Kolkaa waxaa ugu yar midka sarreeyaha

$$\text{yar leh : } \frac{1}{3} < \frac{7}{3} < \frac{20}{3} < \frac{40}{3}.$$

Tusaale 6: U habee jajabyada soo socda sida ay u kala weyn yihiin $\frac{3}{10}, \frac{3}{5}, \frac{4}{6}$

Furfuris: Marka hore isu-barbardhig si lammaana ah

$$\frac{3}{5} > \frac{3}{10} \text{ sababta oo ah } 3 \times 10 > 5 \times 3$$

$$\frac{4}{6} > \frac{3}{5} \text{ sababta oo ah } 4 \times 5 > 3 \times 6$$

$$\text{Sidaa awgeed; } \frac{4}{6} > \frac{3}{5} > \frac{3}{10}$$

Laylis 3.5

- 1** U habee jajabyada soo socda sida ay u kala yar yihiin
- b** $\frac{1}{2}, \frac{3}{4}, \frac{4}{5}$ iyo $\frac{1}{3}, \frac{5}{6}$ **t** $\frac{5}{12}, \frac{2}{3}, \frac{3}{4}$ iyo $\frac{7}{8}$
- j** $\frac{2}{3}, \frac{1}{5}, \frac{1}{6}, \frac{1}{4}$ iyo $\frac{1}{2}$ **x** $\frac{2}{3}, \frac{3}{8}, \frac{3}{10}, \frac{1}{2}$ iyo $\frac{1}{4}$
- 2** U habee jajabyada soo socda sida ay u kala weyn yihiin
- b** $\frac{1}{2}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$ **t** $\frac{1}{5}, \frac{1}{2}, \frac{1}{4}, \frac{1}{3}, \frac{1}{6}$ **j** $\frac{5}{12}, \frac{3}{8}, \frac{3}{10}, \frac{1}{2}$ iyo $\frac{1}{4}$
- 3** U habee jajab-tobanleyaasha soo socda sida ay u kalayar yihiin
- b** 0.6, 0.48, 0.62, 0.91, 0.86, 0.45 **t** 0.57, 0.63, 0.72, 0.48
- 4** U habee jajab-tobanleyaashan siday u kala weyn yihiin
0.58, 0.65, 0.9, 0.28, 0.73
- 5** Kuwa soo socda u rog boqolley isla markaana u habee sida ay u kala yar yihiin 0.2, 0.67, 0.25, 0.35, $\frac{4}{5}, \frac{2}{5}$.

3.4 ISU-GAYNTA IYO KALA-GOYNTA JAJABYADA IYO JAJAB- TOBANLAYAASHA

Cutub-hooseedkani, wuxuu sii xoojin doonaa aqoontiina laxidhiidha isugaynta iyo kala goynta ee jajabyada iyo jajab-tobanlayaasha. Sidoo kale waxaad ku baran doontaan hababka la isugu geeyo loona kala jaro jajabyada hooseeyayaashoodu isku midka yahay & kuwa leh hooseeyayaal kala duwan. Hab-socodka gudahiisa waxaad ku baran doontaan hababka looga shaqeeyo jajabyada leh hooseeyayaal kala duwan sidoo kale ka shaqaynta jajabyada leh hooseeyayaal isku mid ah sida si la mid ah ayaad ku dhigan doontaan xisaab – fallada jajab –tobanle yaasha.

3.4.1 Isu-Geynta jajabyada iyo jajab tobanlayaasha

Ka hor inta aadan isku dayin isu-gaynta jajabyo, waa inaad xusuusataa sida loo soo saaro dhufsane yaraha ay wadaagaan (Dh.Y.W) laba ama in ka badan oo tiro-tirsiimo ah. Si aad isugu geeyo jajabyo leh hooseeyeye iskumid ah, waxaanu qaadan hooseeyaha ay wadaagaan isla markaana isu-geyneyana sarreyeyaasha.

Tusaale 1: Isu-gee

$$\mathbf{b} \quad \frac{5}{6} + \frac{4}{6} \qquad \mathbf{t} \quad \frac{1}{3} + \frac{4}{3}$$

Furfuris: **b** Maadaama labada jajabba leeyihiin hooseeye isku mid ah, waxaad qaadan mid isla markaana isu-gee sarreeyayaashooda.

$$\frac{5}{6} + \frac{4}{6} = \frac{5+4}{6} = \frac{9}{6} = \frac{3}{2}$$

$$\mathbf{t} \quad \text{Sidaas si la mid ah, } \frac{1}{3} + \frac{4}{3} = \frac{1+4}{3} = \frac{5}{3}.$$

Shaqo Koowedka 3.4

1 Haddii la idin weyddiiyey isugeynta jajabyo leh hooseeyyaal kala geddisan, sidee ayaad uga shaqayn lahaydeen? Ku falanqeeya kooxo kana soo jeediyo fasalka.

2 Isu-geeya jajabyada soo socda

$$\mathbf{b} \quad \frac{1}{2} + \frac{1}{3} \qquad \mathbf{t} \quad \frac{1}{4} + \frac{1}{5} \qquad \mathbf{j} \quad \frac{1}{2} + \frac{2}{3}$$

Si aad isugu-geyso jajabyo hooseeyyaal kala duwan leh, marka hore hooseeyyaasha ka dhig isku mid adiga oo isticmaalaya dh y w ee hooseeyyaasha ka dibna isu-gee sarreeyayaasha.

Tusaale 2: Isu – gee jajabyada soo socda.

$$\mathbf{b} \quad \frac{1}{4} + \frac{3}{5} \qquad \mathbf{t} \quad \frac{5}{7} + \frac{1}{2},$$

Furfuris: **b** Maadaama hooseeyyaashu kala duwan yihiin, marka hore hooseeyyaasha ka dhig isku mid. Aan soo saarno dh.y.w ee 4iyo5.

Dhufsaneyaasha 4: 4, 8, 12, 16, 20, 24

Dhufsaneyaasha 5: 5, 10, 15, 20, 25, 30

DH.Y.W 4 iyo 5 waa 20.

Kolkaa, hooseeyyaasha jajabyadu labadaba ka dhigeyna isirka munaasabka ah ee 20.

$$\begin{aligned} \text{Sida darteed; } \frac{1}{4} + \frac{3}{5} &= \frac{1}{4} \times \frac{5}{5} + \frac{3}{5} \times \frac{4}{4} \\ &= \frac{5}{20} + \frac{12}{20} \\ &= \frac{5+12}{20} = \frac{17}{20} \end{aligned}$$

$$\begin{aligned} \text{t} \quad \text{Sidoo kale:} \quad \frac{5}{7} + \frac{1}{2} &= \frac{5}{7} \times \frac{2}{2} + \frac{1}{2} \times \frac{7}{7} \\ &= \frac{10}{14} + \frac{7}{14} = \frac{17}{14} \end{aligned}$$

Ogaal:

$$1 \quad \text{Haddii } \frac{a}{b} \text{ iyo } \frac{c}{d} \text{ yihiin jajabyo, kolkaa, } \frac{a}{b} + \frac{c}{d} = \frac{a \times d + b \times c}{b \times d}.$$

$$2 \quad \text{Haddii } a \frac{b}{c} \text{ ay tahay jajab dhafane, } a \frac{b}{c} = a + \frac{b}{c} = \frac{a}{1} + \frac{b}{c} = \frac{a \times c + b}{c}$$

Tusaale 3: Isu-gee jajabyada soo socda.

$$\text{b} \quad \frac{2}{5} + \frac{3}{4}$$

$$\text{t} \quad 1\frac{1}{3} + 2\frac{1}{2}$$

Furfuris:

$$\begin{aligned} \text{b} \quad \text{Adeegsiga ogaalka sare, } \frac{2}{5} + \frac{3}{4} &= \frac{2 \times 4 + 5 \times 3}{5 \times 4} \\ &= \frac{8 + 15}{20} = \frac{23}{20}. \end{aligned}$$

$$\begin{aligned} \text{t} \quad 1\frac{1}{3} &= \frac{1}{1} + \frac{1}{3} = \frac{1 \times 3 + 1 \times 1}{1 \times 3} = \frac{3 + 1}{3} = \frac{4}{3} \\ 2\frac{1}{2} &= \frac{2}{1} + \frac{1}{2} = \frac{2 \times 2 + 1 \times 1}{1 \times 2} = \frac{4 + 1}{2} = \frac{5}{2} \end{aligned}$$

$$\begin{aligned} \text{Sidaa awgeed; } 1\frac{1}{3} + 2\frac{1}{2} &= \frac{4}{3} + \frac{5}{2} \\ &= \frac{4 \times 2 + 3 \times 5}{3 \times 2} \\ &= \frac{8 + 15}{6} = \frac{23}{6} \end{aligned}$$

Si aad isugu geysa laba jajab-tobanle, qor bilow ilaa dhammaad adiga oo dhibicda dhigaya meelo isku mid ah.

Dabadeed isu wada gee godadka hal tobnaadka hal boqlaadka iyo wixii la mid ah Haddii jajab-tobanluhu godadka tirooyinkoodu isku mid ahayn ku darso eber si ay isugu beegmaan qiimayaasha godadku.

Tusaale 4: Isu-gee jajab-tobanleyaasha soo socda.

$$\text{b} \quad 0.22 + 0.37 \quad \text{t} \quad 0.263 + 0.451 \quad \text{j} \quad 3.84 + 0.372$$

Furfuris:

$$\mathbf{b} \quad \begin{array}{r} 0.22 \\ + 0.37 \\ \hline 0.59 \end{array}$$

$$\mathbf{t} \quad \begin{array}{r} 0.263 \\ + 0.451 \\ \hline 0.714 \end{array}$$

$$\mathbf{j} \quad \begin{array}{r} 3.840 \\ + 0.372 \\ \hline 4.212 \end{array}$$

Kudarso eber si qiimaha
godadku isugu beegmo

Laylis 3.6

1 Jajabyada soo socda mid kasta isu-gee

$$\mathbf{b} \quad \frac{3}{4} + \frac{5}{4}$$

$$\mathbf{t} \quad \frac{1}{6} + \frac{7}{6}$$

$$\mathbf{j} \quad \frac{1}{2} + \frac{1}{4}$$

$$\mathbf{x} \quad \frac{2}{5} + \frac{1}{3}$$

$$\mathbf{kh} \quad \frac{3}{5} + \frac{1}{2} + \frac{1}{3}$$

$$\mathbf{d} \quad \frac{5}{8} + \frac{1}{2} + \frac{2}{3}$$

$$\mathbf{r} \quad \frac{1}{10} + \frac{1}{2}$$

2 Jajab-tobanleyaasha soo socda isugee

$$\mathbf{b} \quad 0.53 + 0.45$$

$$\mathbf{t} \quad 0.47 + 0.35$$

$$\mathbf{j} \quad 0.92 + 0.75$$

$$\mathbf{x} \quad 0.271 + 0.451$$

$$\mathbf{kh} \quad 1.358 + 0.814$$

$$\mathbf{d} \quad 0.385 + 0.6712$$

$$\mathbf{r} \quad 0.925 + 0.034$$

3.4.2 Kala goynta Jajabyada & Jajab tobanleyaasha**Hawlgalka 3.8**

1 Kala goo jajabjyada soo socda:-

$$\mathbf{b} \quad \frac{4}{5} - \frac{1}{5}$$

$$\mathbf{t} \quad \frac{3}{2} - \frac{1}{2}$$

$$\mathbf{j} \quad \frac{7}{8} - \frac{3}{5}$$

2 Hana ayaa soo iibsatay $\frac{3}{4}$ litir oo saliidda cuntada $\frac{1}{4}$ oo saliida ah ayey u isticmaashay inay cunto ugu kariso qoyskeeda, waa intee jajabka saliidda ah ee u hadhay?

3 Kala goo jajab-tobarleyaasho soo socda.

$$\mathbf{b} \quad 0.75 - 0.25$$

$$\mathbf{t} \quad 0.897 - 0.368$$

$$\mathbf{j} \quad 0.749 - 0.387$$

Hababkii aad ku soo adeegsatay isu gaynta ayuun baad ku adeegsan kala goynta. Kala goynta jajabyada waxay la mid tahay sidii aad ku Istimashay isu-gaynta,

aanse ka ahayn halkii sarreryayaasha aad isku gaynaysay ayuun baad kale jari. Sidaa derteed hooseeyayaasha isku midbaad ka dhigi islamarkaana sarreeyayaasha ayaad kala jari.

Balse, waxaad xusuusataa inta aadan jajibka kala jarin ka hor jajibka dhafan u beddel jajib ma-qummane.

Tusaale 5: Jajabyada soo socda kala goo

$$\text{b} \quad \frac{3}{4} - \frac{1}{4} \qquad \text{t} \quad \frac{6}{7} - \frac{1}{2}$$

Furfuris:

- b** Maadaama jajabyada labaduba leeyihiin hooseeye isku mida, waxaanu qaadan hooseeye ay wadaagaan islamarkaana sarreeyayaasha ayaad kala jari.

$$\frac{3}{4} - \frac{1}{4} = \frac{3 - 1}{4} = \frac{2}{4} = \frac{1}{2}$$

- t** Xaaladani Hooseeyayaasha isku mid ma-aha, sidaa awgeed hooseeyayaashaan ka dhigaynaa isku mid anaga oo dooranayna isir ku haboon.

$$\begin{aligned} \frac{6}{7} - \frac{1}{2} &= \frac{6}{7} \times \frac{2}{2} - \frac{1}{2} \times \frac{7}{7} \\ &= \frac{12}{14} - \frac{7}{14} = \frac{12 - 7}{14} = \frac{5}{14} \end{aligned}$$

Tusaale 6: Kuwa soo socda kala goo

$$\text{b} \quad 0.73 - 0.23 \qquad \text{t} \quad 0.4 - \frac{1}{5}$$

Furfuris:

$$\text{b} \quad \frac{0.73}{0.50}$$

- t** Maadaama tibxaha la ina siiyey ayna isku mid ahayn, marka hore jajibka aan u beddelno jajib – tobanle.

$$\frac{1}{5} = 0.2$$

$$\text{Kolkaa: } 0.4 - \frac{1}{5} = 0.4 - 0.2 = 0.2$$

Ogaal: Haddii $\frac{a}{b}$ iyo $\frac{c}{d}$ ay jajab yihiin, oo, $\frac{a}{b} > \frac{c}{d}$ markaa

$$\frac{a}{b} - \frac{c}{d} = \frac{a \times d - b \times c}{b \times d}$$

Tusaale 7: Kala goo jajabyada soo socda.

$$\text{b} \quad \frac{6}{5} - \frac{3}{5} \qquad \text{t} \quad \frac{14}{2} - \frac{7}{3}$$

$$\text{Furfuris: b} \quad \frac{6}{5} - \frac{3}{5} = \frac{6 \times 1 - 3 \times 1}{5}$$

$$= \frac{6 - 3}{5} = \frac{3}{5}$$

$$\text{t} \quad \frac{14}{2} - \frac{7}{3} = \frac{14 \times 3 - 7 \times 2}{2 \times 3}$$

$$= \frac{42 - 14}{6}$$

$$= \frac{28}{6} = \frac{14}{3}$$

Laylis 3.7

1 Kala goo jajabyada soo socda.

$$\text{b} \quad \frac{3}{4} - \frac{1}{8} = \underline{\quad} \qquad \text{t} \quad \frac{6}{7} - \frac{1}{2} = \underline{\quad} \qquad \text{j} \quad \frac{7}{9} - \frac{1}{3} = \underline{\quad}$$

$$\text{x} \quad \frac{7}{8} - \frac{1}{12} = \underline{\quad} \qquad \text{kh} \quad \frac{5}{8} - \frac{1}{3} = \underline{\quad} \qquad \text{d} \quad \frac{4}{5} - \frac{5}{12} = \underline{\quad}$$

$$\text{r} \quad \frac{5}{12} - \frac{1}{8} = \underline{\quad} \qquad \text{s} \quad \frac{28}{10} - \frac{14}{8} = \underline{\quad}$$

$$\text{sh} \quad \frac{16}{12} - \frac{16}{12} = \underline{\quad} \qquad \text{dh} \quad \frac{19}{5} - \frac{14}{5} = \underline{\quad}$$

2 Kala goo jajab-tobanleyaasha soo socda:

$$\text{b} \quad 0.469 - 0.142 \qquad \text{t} \quad 0.847 - 0.307 \qquad \text{j} \quad 0.682 - 0.471$$

$$\text{x} \quad 0.889 - 0.268 \qquad \text{kh} \quad 0.759 - 0.432 \qquad \text{d} \quad 0.123 - 0.2$$

3 Kala goo jajabyada soo socda

$$\text{b} \quad 20\frac{2}{5} - 17\frac{1}{2} \qquad \text{t} \quad 6\frac{1}{3} - 2\frac{1}{3} \qquad \text{j} \quad 5\frac{2}{5} - 2\frac{1}{4}$$

- 4 Nin beeraley ah ayaa $\frac{1}{5}$ ka qoday dhulka beertiisa maalintii isniinta ahayd, $\frac{1}{4}$ waxuu qoday Talaadadii, hadii baaxada dhulbeereedku yahay 1
- b** Waa intee dhulka jajab ahaan u hadhay ee aan la qodin?
t Boqolkiiba dhul intee ah ayaa la qoday?
j Boqolkiiba dhul in tee ah ayaan la qodin?

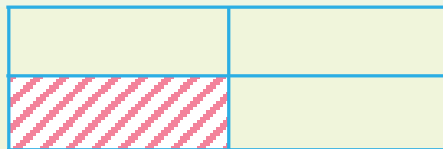
3.5 ISKUDHUFASHADA IYO ISUQAYBINTA JAJABYADA IYO JAJAB-TOBANLAYAASHA

Fasalladeenii hoose waxaad xariif ku ahayd isku dhufashada jajabyada guud ahaan iyo gaar ahaanba. Mowduuc hooseedkani waxaad aqoontaada ku kobcin doontaa isku dhufashada jajabyada iyo shaqo leh masalooyin aad ku leylyamaysid, taas oo khusaysa isku dhufashada jajabyada & jajab-tobanleyaasha.

3.5.1 Iskudhufahsada Jajabyo iyo Jajab - tobanleyaasha

Hawlgalka 3.9

- 1 Eeg jaantuska hoose isla markaana ka jawaab su'aalahan soo socda.



Janntaska 3.3

- b** Imisa qeyb isleeg ayuu u qaybsan yahay shaxanku?
t Maku tibaaxi kartaa jajab badh kamid ah shaxanka?
j Ma u tibaaxi karata qaybta hadhaysan jajab?
x Ma u tibaaxi karataa qaybta hadhaysan sidi iskudhufashada laba jajab?
- 2 Soo saar badhka jajabbada soo socda
- | | | | | | | | |
|-----------|---------------|----------|---------------|----------|---------------|----------|---------------|
| b | 2 | t | $\frac{1}{2}$ | j | $\frac{1}{3}$ | x | $\frac{1}{4}$ |
| kh | $\frac{3}{4}$ | d | $\frac{5}{6}$ | r | $\frac{2}{3}$ | s | $\frac{6}{5}$ |

- 3** Soo saar $\frac{1}{4}$ kuwa soo socda.
- b** $\frac{2}{15}$ **t** $\frac{1}{6}$ **j** $\frac{2}{5}$ **x** $\frac{5}{8}$ **kh** $\frac{10}{9}$
- 4** Waa intee $\frac{2}{3}$ ee 60?
- 5** Raadi $\frac{2}{3}$ ee 45.
- 6** Isku-dhufo jajab-tobanlaha lagu siiyey.
- b** 0.342×2 **t** 0.0213×0.2 **j** 0.412×0.21
- 7** Cayaaryahan ayaa cabba $\frac{3}{4}$ litir oo caano ah shan maalmood toddobaadkii, imisa litir oo caano ah ayuu cabbaa cayaaryahanku toddobaad kasta?

Jajab ayaan ku dhufan karnaa jajab, sidoo kale jajabnn waxaan kudhufan karnaa jajab-tobanle ama mid tobanle –tobanle kale.

Si aad laba jajab isugu dhufato, sarreeyaha jajabyada midkood ayaad ku dhufan sarreeyaha jajab kale iyo hooseeyaha mid ayaad ku dhufan hooseeyaha midka kale.

Ogaal: Erayga “ee” Macnaahisu waa isku dhufasho.

Tusaale ahaan: $\frac{2}{3}$ ee 60 macno ahaan waa, $\frac{2}{3} \times 60 = \frac{120}{3} = 40$

$\frac{2}{5}$ ee 0.7 macno ahaan waa, $\frac{2}{5} \times 0.7 = 0.4 \times 7 = 0.28$

Tusaale 1: iskudhufo jajabyada soo socda.

b $\frac{1}{2} \times \frac{1}{3}$ **t** $\frac{2}{3} \times \frac{5}{7}$

j $\frac{6}{7} \times \frac{14}{15}$ **x** $1\frac{1}{2} \times \frac{5}{6}$

Furfuris: **b** $\frac{1}{2} \times \frac{1}{3} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$

t $\frac{2}{3} \times \frac{5}{7} = \frac{2 \times 5}{3 \times 7} = \frac{10}{21}$

j $\frac{6}{7} \times \frac{14}{15} = \frac{6 \times 14}{7 \times 15} = \frac{84}{105} = \frac{4}{5}$

$$\begin{aligned} \times \quad 1\frac{1}{2} \times \frac{5}{6} &= \frac{3}{2} \times \frac{5}{6} \text{ (sababta oo ah } 1\frac{1}{2} = 1 + \frac{1}{2} = \frac{3}{2}\text{)} \\ &= \frac{15}{12} = \frac{5}{4} = 1\frac{1}{4} \text{ (jajab-dhafan ahaan ayey u qoran)} \end{aligned}$$

Tusaale 2: Isku dhufo jajab-tobanlayaasha soo socda

$$\mathbf{b} \quad 0.32 \times 0.5 \qquad \mathbf{t} \quad 0.802 \times 0.31$$

Furfuris: $\mathbf{b} \quad 0.32 \times 0.5$

Marka Hore 32 kudhufo 5, kuna siinaysaa 160, si aad u sugto meesha dhibicda waxaad tirin tirada godadka ee ka dambeeye dhibicda jajabyada labaduba, waxayna tahay 3. Sidaas awgeed tarantu waa inay lahaato 3 god oo ka danbeeya barta jajabtobanlaha(dhibicda), kolkaa $0.32 \times 0.5 = 0.160$.

Tallaabooyinka soo socdo ayaan ku soo koobi karnaa

Tallaabade 1: Ka tir dhibicda

Tallaabade 2: Raadi 32×5

Tallaabade 3: dib u dhig dhibic (wadarta tirada godadka ka dambeeye dhibicda ee weydiinta waxay leegtahay tirada godadka ka dambeeye dhibicda ee jawaabta.

$$\mathbf{t} \quad 0.802 \times 0.31$$

Sidoo kale

$802 \times 31 = 24862$ isla markaa dhibicdu waa inay noqotaa shan god ka dib,

Sidaa darteed; $0.802 \times 0.31 = 0.24862$

Sidan ayaan u soo koobi karnaa

Tallaabade 1: Tir dhibicda

Tallaabade 2: Raadi 802×31

Tallaabade 3: Dhig dhibicda ee ee natiijadu 0.24862 waxaan ku soo ururiin karnaa laba jajab sida 0.25

Sidoo kale waxaa suurtagal ah in jajab-tobanle lagu dhufto jajab, laakiinse waa inaanu tibaaxaha isku mid ka dhignaa. Taas oo macnaheedu yahay in labaduba u beddelno jajab ama aan u rognu god-tobanle.

Tusaale 3: Isku-dhufo

$$\mathbf{b} \quad 0.25 \times 4 \qquad \mathbf{t} \quad \frac{4}{9} \times 0.57 \qquad \mathbf{j} \quad \frac{5}{9} \times 0.25$$

Furfuris: **b** Marka hore 0.25 aan u bedelno jajab.

$$0.25 = \frac{25}{100} = \frac{1}{4}$$

$$\text{Kolkaa } 0.25 \times 4 = \frac{1}{4} \times \frac{4}{1} = 1$$

t Marka hore 0.57 aan u beddelno jajab

$$0.57 = \frac{57}{100}$$

$$\text{Kolkaa: } 0.57 \times \frac{4}{9} = \frac{57}{100} \times \frac{4}{9} = \frac{228}{900} = \frac{19}{75}$$

$$\mathbf{j} \quad \text{Sidoo kale } \frac{5}{9} \times 0.25 = \frac{5}{9} \times \frac{25}{100} = \frac{125}{900} = \frac{5}{36}$$

Layli 3.8**1** Iskudhufo jajabyada lagu siiyey

$$\mathbf{b} \quad \frac{1}{2} \times \frac{2}{3} \qquad \mathbf{t} \quad \frac{1}{6} \times \frac{12}{13} \qquad \mathbf{j} \quad \frac{27}{11} \times \frac{11}{27}$$

$$\mathbf{x} \quad \frac{35}{13} \times \frac{13}{35} \qquad \mathbf{kh} \quad \frac{20}{9} \times \frac{7}{10} \qquad \mathbf{d} \quad \frac{3}{5} \times \frac{15}{18}$$

$$\mathbf{r} \quad \frac{10}{143} \times \frac{143}{27} \qquad \mathbf{s} \quad \frac{8}{17} \times \frac{51}{64} \qquad \mathbf{sh} \quad 2\frac{2}{3} \times \frac{6}{7}$$

$$\mathbf{dh} \quad 2\frac{2}{5} \times 2\frac{1}{2}$$

2 Iskudhufo jajab-tobanlaha lagu siiyey

$$\mathbf{b} \quad 0.75 \times 0.32 \qquad \mathbf{t} \quad 0.59 \times 0.13$$

$$\mathbf{j} \quad 0.612 \times 0.02 \qquad \mathbf{x} \quad 0.861 \times 0.121$$

3 Iskudhufo

$$\mathbf{b} \quad 0.75 \times \frac{2}{3} \qquad \mathbf{t} \quad 0.5 \times \frac{1}{2} \qquad \mathbf{j} \quad 0.625 \times \frac{1}{4}$$

$$\mathbf{x} \quad 0.5 \times \frac{21}{20} \qquad \mathbf{kh} \quad 0.35 \times \frac{1}{7}$$

4 Ka jawaab su'aalaha soo socda.

b Waa intee boqolkiiba 10 ee 60 **t** Soo saar $\frac{5}{9}$ ee $\frac{2}{7}$

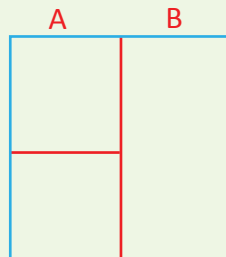
j Waa maxay taranta $\frac{4}{5}$ iyo $\frac{15}{16}$

3.5.2 Isuqaybinta Jajabyada iyo Jajab – tobanleyaasha`

Hawlgalka 3.10

1 Miyaad heli kartaa $\frac{1}{2}$ ee $\frac{1}{2}$ sideed ugu muujin kartaa adigoo isticmaalaya jajab?

2 Jaantuska hoose, waxaa jira laba sanduuqyo, haddii aad u qeybiso sanduuqa A hoostiisa laba meelood oo isle'eg, waa maxay maxsuulku? (Adigoo isticmaalaya jajab).



3 $\frac{1}{2}$ u qeybi jajabka $\frac{2}{5}$, macnaheedu waa $\frac{1}{2} \div \frac{2}{5}$

4 Raadi $\frac{1}{2} \times \frac{5}{2}$

5 Isbarbar dhig jawaabaha aad ka heshay 3 iyo 4, miyaad u dhigi kartaa qaab-guud?

6 **b** xisaabi $\frac{12}{25} \div \frac{4}{5}$ **t** xisaabi $\frac{12}{25} \div \frac{5}{4}$

j isbarbar dhig jawaabaha b iyo t iskuday inaad u dhigto qaab (hab) guud.

7 Xisaabi $0.125 \div 0.35$

Isuqeybinta jajabyadu waa ta ugu fudud marka loo eego rogaaladooda jajabkastaa wuxuu leeyahay rogaal isku-dhufasho rogaalka jajabku waa jajab kale kaasoo marka lagu dufto jajabka tarantu noqoto 1.

Tusaale: Rogaalka isku dhufashada ee $\frac{2}{3}$ waa $\frac{3}{2}$. Sidaad ugu qeybiso jajabka $\frac{b}{t}$ jajabka $\frac{j}{x}$, $\frac{b}{t}$ ku dhufo rogaalka $\frac{j}{x}$ sida: $\frac{b}{t}$ iyo $\frac{j}{x}$ waa jajabyo, dadadeedna

$$\frac{b}{t} \div \frac{j}{x} = \frac{b}{t} \times \frac{x}{j} = \frac{b \cdot x}{t \cdot j}$$

Tusaalaha 4: xisaabi kuwan soo socda

$$\mathbf{b} \quad 6 \div \frac{11}{3} \quad \mathbf{t} \quad \frac{1}{2} \div \frac{13}{5} \quad \mathbf{j} \quad \frac{4}{7} \div \frac{16}{21}$$

Furfuris: $\mathbf{b} \quad 6 \div \frac{11}{3} = \frac{6}{1} \times \frac{3}{11} = \frac{18}{11}$

$$\mathbf{t} \quad \frac{1}{2} \div \frac{13}{5} = \frac{1}{2} \times \frac{5}{13} = \frac{5}{26}$$

$$\mathbf{j} \quad \frac{4}{7} \div \frac{16}{21} = \frac{4}{7} \times \frac{21}{16} = \frac{84}{112} = \frac{3}{4}$$

Jajabtobanle si loogu qeybiyo jajabtobanle, marka 1^{aad} waa inaad u bedeshaa oo labada jajabtobanleba jajab, dadbadeedna isticmaal habka jajab loo qeybinayo jajab.

Tusaalaha 5: xisaabi kuwan soo socda

$$\mathbf{b} \quad 0.2 \div 0.4 \quad \mathbf{t} \quad 25.6 \div 0.16$$

Furfuris: $\mathbf{b} \quad 0.2 \div 0.4$ si aad isugu qeybiso marka 1^{aad} u bedel labadaba jajabyo.

Haddaba, $0.2 \div 0.4$

$$0.2 = \frac{2}{10} = \frac{1}{5}$$

$$0.4 = \frac{4}{10} = \frac{2}{5}$$

$$\text{Sidaas darteed } 0.2 \div 0.4 = \frac{1}{5} \div \frac{2}{5} = \frac{1}{5} \times \frac{5}{2} = \frac{5}{10} = \frac{1}{2} = 0.5$$

$\mathbf{t} \quad$ Si la mid ah

$$25.6 = \frac{256}{10}, \quad 0.16 = \frac{16}{100}$$

$$\text{Sidaas darteed } \frac{256}{10} \div \frac{16}{100} = \frac{256}{10} \times \frac{100}{16} = \frac{25600}{160} = 160$$

Habka kale ee jajabtobanle loogu qeybin karaa jajabtobanle kale waa in loo bedelo jajab tobanleyaasha tirooyin tirsiimo, ayadoo loo dhaqaajinayo barta jajabtobanlaha xagga midig inta lagama maarmaanka ah si looga dhigo tiro tirsiimo, dabadeedna isticmaal qeybinta dheer.

Tusaalaha 6: 21.5 u qeybi 0.006

Furfuris:
$$\frac{21.5}{0.006} = \frac{21.5 \times 1000}{0.006 \times 1000}$$

$$= \frac{21500}{6} = 3583.33 \text{ (marka lagu soo ururiyo laba god).}$$

Qormo saynis

Tirooyinka tirsiiimo waxaa loo qori ama caddayn karaa qaabab kala duwan.

Hal nooc waxaa loo yaqaan qormosaynis tiro markaan qorayno anagoo isticmaaleyna qormo saynis, tirada waxaa loo qori sida taranta jajabtobanle iyo jibbaarka 10.

Sida 10 (10, 100, 1000) adoo hal tiro ama hal-god oo aan ahayn eber uu ka horeeyo barta jajabtobanlaha.

Tusaalaha 7:

- 1 39 waxaa loo qori karaa ayadoo la isticmaalayo qormo-saynis sida 3.9×10 .
- 2 $216 = 2.16 \times 10^2$ (Qormo saynis)
- 3 $2192 = 2.192 \times 10^3$ (Qormo saynis)
- 4 $960 = 9.6 \times 10^2$ (Qormo saynis)

Laylis 3.9

1 Xisaabi kuwan soo socda

b $\frac{1}{5} \div \frac{3}{10}$

t $\frac{3}{4} \div \frac{1}{3}$

j $\frac{3}{4} \div \frac{1}{6}$

x $2 \div 2\frac{1}{3}$

kh $3\frac{1}{2} \div \frac{1}{3}$

d $\frac{7}{10} \div \frac{3}{20}$

2 Xisaabi kuwan soo socda

b $2.3 \div 10$

t $3.6 \div 100$

j $9.6 \div 0.96$

x $3.2 \div 4$

kh $0.354 \div 5.004$

d $0.042 \div 6$

r $52.5 \div 5.5$

3 Xisaabi kuwan soo socda

b $0.4 \div \frac{1}{4}$

t $\frac{1}{2} \div \frac{3}{5}$

j $\frac{4}{7} \div \frac{16}{21}$

x $5 \div 2.3$

kh $1.25 \div 0.05$

d $0.25 \div 0.75$

r $10 \div \frac{1}{5}$

s $\frac{4}{5} \div \frac{2}{5}$

sh $\frac{2}{3} \div \frac{16}{24}$

4 U qor tirooyinka soo socda qormo saynis

b 35

t 105

j 2005

x 191

kh 8900

Hubin

⇨ Boqolkiiba

⇨ Heerka u hooseeya ee jajabka

⇨ Horsanaanta jajabyada/
jajabtobanleyaasha⇨ Horsanaanta sida u kala
waaweyn yihiin⇨ Horsanaanta siday u kala yar-
yihiin jajab⇨ Isbarbar-dhiga
jajabyada/jajabtobanleyaasha

⇨ Isku dhufashada jajabyada

⇨ Isku-dhufashada
jajabtobanleyaasha

⇨ Isugeynt jajabtobanleyaasha

⇨ Isugeynta jajabyada

⇨ Isuqeybinta jajabyada

⇨ jajab

⇨ Jajab maqumane

⇨ Jajab qumane

⇨ Jajab tobanle

⇨ Jajab tobanlaha dhammaada

⇨ Kala goynta jajabka

⇨ Kalagoynta jajabtobanleyaasha

⇨ Ku soo ururinta barta
jajabtobanlaha

⇨ Qormo-saynis

⇨ Tiro dhafan

⇨ U bedelida boqolkiiba jajab

⇨ U bedelida jajabka boqolkiiba

⇨ U bedelida jajabka jajabtobanle

⇨ U bedelida jajabtobanlaha


Soo Koobidda Cutubka

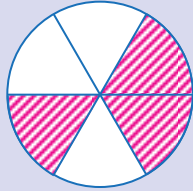
- 1 Jajabka waxaa lagugu siin karaa jajab qumane, ma-qumane ama tiro dhafan.
- 2 Jajabka $\frac{b}{t}$ waxaa la yidhaa wuxuu u qoran yahay heerkiisii ugu hooseeyey haddii IWW $(b, t) = 1$
- 3 IWW sareeyadaha iyo hooseeyaha jajabka waxaa loo isticmaalaa siloogu fududeeyo heerkiisa ugu hooseeya.
- 4 Boqolaydu waa jajab hooseeyihiisu yahay 100.
- 5 Jajabka $\frac{b}{t}$ wuxuu ku siiyaa jajabtobanle dhammaada, marka qeybinta dheeri ay ku siiso barta jajabtobanlaha dabadeed tiro god oo go'an.
- 6 Jajabka $\frac{b}{t}$ wuxuu ku siiyaa jajabtobanle aan dhammaan, marka qeybta dheeri ku siiso tirooyinka godadka oo aan dhammaan barta jajabtobanlaha dabadeed
- 7

| | |
|---|---|
| <p>i $\frac{b}{t} + \frac{j}{t} = \frac{b+j}{t}$</p> | <p>ii $\frac{b}{t} + \frac{j}{x} = \frac{b \times x + t \times j}{t \times x}$</p> |
| <p>iii $\frac{b}{t} - \frac{j}{x} = \frac{bx-tj}{tx} (bx > tj)$</p> | <p>iv $\frac{b}{t} \times \frac{j}{x} = \frac{b \times j}{t \times x}$</p> |
| <p>v $\frac{b}{t} \div \frac{j}{x} = \frac{b}{t} \times \frac{x}{j}$</p> | <p>vi $\frac{b}{t} - \frac{j}{t} = \frac{b-j}{t} (b > j)$</p> |
- 8 isku-dhufashada iyo isuqeybinta jajabtobaleyaasha waxaa looga shaqayn kara ayadoo marka hore loo bedelayo jajabyo u dhigma.
- 9 Markaan leenahay b ee t erayga "ee" waxaa loo isticmaalaa isku-dhufasho sida: waxaan u jeednaa $b \times t$.
- 10 U qorida loo qoro tiro qormo saynis waxaan u jeednaa, u qorida tiro loo qoro taranta jajab tobanle iyo jibbaarada 10 kaasoo jajabtoanlaha ay ka horeyso barta jajabtobanlaha hal-tiro oo aan ahayn eber.

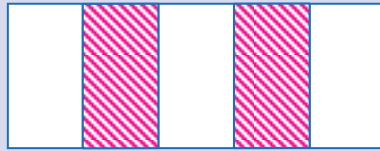
? Layliska Nakhtiinka ee Cutubkaa 3^{aad}

1 Jajab intee ah ayaa hadhysan shaxanka?

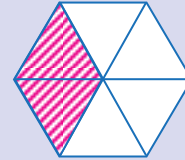
b



t



j



2 U fududee jababyada soo socda tibixda ugu yar.

| | | | | | | | |
|-----------|-----------------|----------|-----------------|----------|-----------------|----------|-----------------|
| b | $\frac{18}{10}$ | t | $\frac{24}{42}$ | j | $\frac{9}{36}$ | x | $\frac{55}{77}$ |
| kh | $\frac{21}{28}$ | d | $\frac{48}{84}$ | r | $\frac{18}{20}$ | | |

3 Jajabyada soo socda kuwee ah tibix – hooseed

| | | | | | | | |
|-----------|-----------------|----------|-----------------|----------|-----------------|-----------|-----------------|
| b | $\frac{15}{20}$ | t | $\frac{6}{9}$ | j | $\frac{1}{3}$ | x | $\frac{13}{24}$ |
| kh | $\frac{64}{72}$ | d | $\frac{14}{15}$ | r | $\frac{9}{100}$ | sh | $\frac{5}{6}$ |

4 Minguuri oo dhamaystir tusaha hoose

| | b | t | j | x | kh | d | r | s | sh | dh | c |
|----------------|-----|---------------|------|----------------|------|----------------|------|-------|---------------|------|-------|
| Jabjab tobanle | 0.2 | | 0.51 | | 0.85 | | 0.35 | | | | 0.375 |
| Jabjab | | $\frac{2}{5}$ | | $\frac{13}{4}$ | | $\frac{2}{25}$ | | | $\frac{5}{8}$ | | |
| Boqolley | 20% | | | | | | | 12.5% | | 100% | |

5 Jajabyada soo socda u bedel jajab tobanle

| | | | | | | | |
|-----------|-----------------|----------|----------------|----------|-----------------|----------|-----------------|
| b | $\frac{1}{10}$ | t | $\frac{8}{10}$ | j | $\frac{4}{10}$ | x | $\frac{3}{5}$ |
| kh | $\frac{19}{20}$ | d | $\frac{3}{50}$ | r | $\frac{39}{50}$ | s | $\frac{17}{25}$ |

6 Boqolleyda soo socda ubedel jajabyo

| | | | | | | | |
|-----------|-------|----------|-------|----------|------|----------|-------|
| b | 15.5% | t | 7.5% | j | 0.5% | x | 17.3% |
| kh | 45% | d | 0.05% | | | | |

7 Jajabyada soo socda ubedel boqolley

$$\begin{array}{lll} \mathbf{b} & \frac{19}{100} & \mathbf{t} \quad \frac{43}{100} & \mathbf{j} \quad \frac{7}{10} \\ \mathbf{x} & \frac{19}{25} & \mathbf{kh} \quad \frac{7}{20} & \end{array}$$

8 Jajabyada soo socda u habee horsanaanta yaraanta

$$\begin{array}{ll} \mathbf{b} & \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{2}{3} \\ \mathbf{j} & \frac{7}{10}, \frac{5}{6}, \frac{7}{9}, \frac{3}{4} \end{array} \quad \begin{array}{ll} \mathbf{t} & \frac{1}{2}, \frac{4}{7}, \frac{5}{8}, \frac{3}{4} \\ \mathbf{x} & \frac{9}{25}, \frac{7}{20}, \frac{1}{4} \end{array}$$

9 Jajabyada soo socda u habee Horsanaanta korodhka

$$\mathbf{b} \quad \frac{1}{2}, \frac{2}{5}, \frac{7}{10}, \frac{4}{5} \quad \mathbf{t} \quad \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{3}{5} \quad \mathbf{j} \quad \frac{1}{2}, \frac{7}{12}, \frac{4}{6}, \frac{9}{20}$$

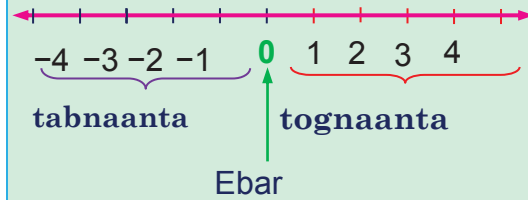
10 Qiimee kuwa soo socda

$$\begin{array}{lll} \mathbf{b} & 1\frac{1}{2} + \frac{4}{9} & \mathbf{t} \quad 2 + \frac{5}{8} + \frac{7}{8} & \mathbf{j} \quad \frac{1}{4} + \frac{1}{3} + \frac{1}{2} \\ \mathbf{x} & 3\frac{2}{3} - 1\frac{3}{4} & \mathbf{kh} \quad \frac{3}{4} - \frac{1}{4} & \mathbf{d} \quad \frac{3}{4} - \frac{3}{8} \\ \mathbf{r} & \frac{7}{10} - \frac{3}{5} & \mathbf{s} \quad \frac{3}{4} \times \frac{5}{5} & \mathbf{sh} \quad \frac{7}{6} \times \frac{2}{5} \\ \mathbf{dh} & \frac{3}{5} \times \frac{25}{6} & \mathbf{c} \quad \frac{2}{3} \times \frac{6}{5} \times \frac{15}{2} & \mathbf{g} \quad 1.27 + 5.063 \\ \mathbf{f} & 4.5 + 1.83 & \mathbf{q} \quad 0.009 + 0.435 & \mathbf{k} \quad 5.063 - 1.27 \\ \mathbf{l} & 4.5 - 1.83 & \mathbf{m} \quad 1 - 0.999 & \mathbf{n} \quad 6.3 \times 0.9 \\ \mathbf{w} & 0.04 \times 0.004 & \mathbf{h} \quad 0.4 \times 0.3 \times 0.028 & \end{array}$$

11 Dhamasytir jog u tax kasta, jiif utax iyo xagalgooyaha laydiga waa inay wadartooda isku mid noqoto.

| | | |
|----------------|---|----------------|
| $3\frac{1}{2}$ | | |
| | s | 3 |
| | | $6\frac{1}{2}$ |

CUTUBKA 4^{aad}



ABYOONEYAASHA

Maxsuulka Cutubka:

Cutubkan dabadii, ardaydu waxay awoodi doontaa;

- *in ay fahmaan fikirka abiyoonayaasha*
- *in ay ku soo jeediyaan abiyoonayaasha dusha xariiqa tirada*
- *in ay ka shaqeeyaan xisaab falooyinka.*

Tusmooyinka ugu muhiimsan:

4.1 Hordhaca Abyoonayaasha

4.2 Isbarbardhiga iyo Habeynta Abyoonayaasha

4.3 Iskudarka iyo kala jarka Abyoonayaasha

Hubin

Soo koobidda cutubka

Layliska nakhtiinka

HORDHAC

Cutubkan waxaa ku sugan dabeecadaha abyoonaaha iyo qaar ka mid ah artimeetikada abyoonaaha. Ujeeddada cutubkan waa fahanka lidka, tirooyinka togan iyo kuwa taban, xariiqta tirada iyo calaamadaha. Waxaa kaloo cutubka ka mid ah cashiro ardayda fahansiin doona waxa uu yahay abyoone, sida loogu isticmaalo nolosheena dhabta ah, iyo kadib wuxuu siin doonaa istiraatiijiyada iyo xeerarka iskudarka, kala goynta, isbarbardhigida iyo habeynta abyooneyaasha.

4.1 BARASHADA ABYOONEYAASHA

Hawlgalka 4.1

Ka soo qaad inaad haysatid 5 Birr, Haddii Nacanaca qiimahiisu yahay 1 Birr

- b** Haddii aad iibsato 3 nanac ah, Imisa Birr ayaa kuu hadhay?
- t** Haddii aad iibsato 5 nanac ah, Imisa birr ayaa kuu hadhay?
- j** Miyaad ku iibsan kartaa 7 nanac ah lacagta aad haysata?
- x** Haddaad doonayso inaad iibsato 7 nanac, maxaad samayn?

Waa maxay qiimaha faraqa u dhaxeeya 10 iyo 9? Waxaa cad jawaabtaadu in ay tahay 1. Laakiin maxay tahay jawaabtaadu markii lagu su'aalo qiimaha $9 - 10$? Waxaa laga yaabaa in aad odhatid su'aashani ma laha jawaab, sababtoo ah ururada tirooyinka ah eed soo dhigatay sida tiro idil ayaa dhici karta in uusan ku siinin. Si kastooy tahayba xisaabfalka kore waa mid macno ku fadhiya.

Ka soo qaad waxaad haysataa 9 riyaal waxaad rabtaa in aad ku gadato kubad yar qiimaheedu yahay 10 riyaal. Waxaad ogtahay inaynan kuu goyneynin lacagta aad wadatid sababtoo ah waxaa kaa dhiman 1 riyaal. Laakiin waxaa laga yaabaa in aad leedahay saaxiib ku amaahiya hal riyaal kadib sagaalkii riyaal eed haysatay si ay kuugu noqoto 10 riyaal kadibna, waxaad ku gadan kubadii yarayd, dhanka kale haddii aad haysatid 11 riyaal, hal riyaal baa dheeri ku noqon qiimaha kubadda.

Tusaalahan kore waxaan ka fahmi karnaa in 9 riyaal ay ka yar tahay hal 10 kariyaal, iyo kadib waxaad haysataa riyaal dheeri ah si aad u gadatid kubadda, hal dheeri ah waxaa lagu muujiyaa $+1$. hal ka yar wuxuu ku lid yahay hal dheeri ah. Waxaynu isticmaali -1 si aan u muujino hal ka yar. Taas oo ah -1 waa lidka $+1$.

Boqolaal sano ka hor xisaabyahanadu waxay garteen dhibaatooyin badan in lagu xalin lahaa haddii loo helo wado lagu helo tirooyinka ka hooseeya ebar.

Sidaa darteed, waxay go'aansadeen in ay u qoraan $0 - 1 = -1$, taas oo loo akhriyo sida “hal taban” oo lamacno ah “hal ka yaree bar”. Inaga oo ka anbaqaadeyna wixii kor aan ku soo sheegnay ee ahaa dayntii riyaalka ahaa, waxaynu arki karnaa $9 - 10 = -1$ (markii aad kharashgareysay 10, waxaa ku soo raacay riyaalkii saaxiibkaa).

$-1 + 1 = 0$ (markii aad kaydisid hal riyaal eed saaxiibkaa u celisid, waxaad haysaa waxba). Heer kulku waa wado kale oo loo adeegsado abiyoonaha. Fiiri kulbeega, iyo waxaad arki doontaa in heerkulku uu u dhaadhici karo ilaa dhigriiga ebar.

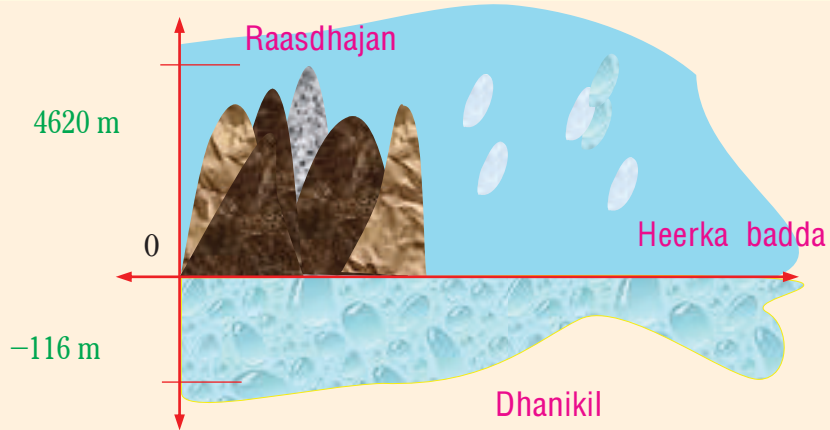


Jaantuska 4.1

Heerkulka ka hooseeya eber waxaa lagu qoraa tirooyinka taban, sida -5 digrii taas oo lamacno ah 5 digrii yuu ka hooseeyaa eber, haddii heerkulka xiliga hadhsiiimaha uu yahay 9 digrii iyo habeenkiina uu noqdo 12 digrii oo qabaw ah, wuxuu noqon doonaa -3 digrii.

Hadda bal aan eegno masalooyinkan soo socda.

Tusaale 1: Buurta ugu dheer Itoobiya waa Raasdhajan, midaas oo heerka badda ka sareysa 4,620 metir. Meesha ugu hooseysa waa Dhanakil, midaas oo heerka badda ka hooseysa 116 metir. Waa maxay faraqa u dhaxeeya cidhifka u sareeya ee Raadhajan iyo salka Dhanakil?



Jaantuska 4.2

Furfuris: Cidhifyada waxaad ku muujin kartaa abiyoonaaha.

| | Abiyoone |
|-------------------------------------|----------|
| 4,620 metir ka sareysa heerka badda | + 4,620 |
| Heerka badda | |
| 116 metir ka hooseysa heerka badda | -116 |

Fogaanshaha laga bilaabo cidhifka buurta Raasdhajan ilaa heerka badda waa 4,620 miter iyo fogaanta heerka badda ilaa salka Dhanakil waa 116. Wadarta fogaantu waa 4,736 miter.

Masaladan kore waxa loo isticmaalay fikirka iskulidka. Ka koreeya heerka badda wuxuu lid ku yahay ka hooseeya heerka badda.

Halkan waxaa ah tusaalooyin dheeraad ah:

| | | | |
|---------------------|---------------|-----------|------------|
| Dib u dhac, Horumar | Qaate, bixiye | Kor, hoos | Yar, badan |
|---------------------|---------------|-----------|------------|

Hawlgalka 4.2

1 Qor tiro ka turjumeysa xaalad kasta

| Xaalada | Qiimaha tirada |
|------------------------------|----------------|
| 10 digrii oo ka sareysa ebar | |
| Khasaare 13 riyaal ah | |
| Dib u dhac saddex talaabo ah | |

2 Qor abiyoono ka turjumaya weedhahan soo socda

Guuleed markii u galay socdaal 5: oo subaxnimo u ku qaadanayay tababar, heerkulku wuxuu ahaa 40°C oo ka hooseeya ebar. Markii uu soo noqday 9:30AM heerkulku wuxuu ahaa 11°C oo ka sareeya ebar.

Qeexid 4.1: Ururka abiyoono ee lagu calaamadiyo \mathbb{Z} wuxuu ka kooban yahay tirooyinka tirsiiimo, lidkooda, iyo Ebar, midaas oo ah $\mathbb{Z} = \{ \dots -3, -2, -1, 0, 1, 2, 3 \}$

Tusaale 2: Lidka 4 waa -4 iyo lidka -6 waa 6.

Maadaama 0 ayna ahayn togane ama tabane toona, lidka 0 waa 0 (midaas oo ah 0 iyada qudhigeeda yaa lid isku ah).

Abiyoono yaashu waxaa lagu calaamadiyaa \mathbb{Z} (midaas oo u taagan erayga “Zahlen” kaas oo ah luuqada Jarman macnaheedu yahay abiyoono).

Dhinac kale Abiyoonuhu wuxuu ka kooban yahay tirooyin tirsiiimo, ebar iyo lidka tirooyinka tirsiiimo.

$\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \dots$

Ebar

“–” waa calaamada tabnaanta

“+” waa calaamada tognaanta

Midaasi waxay tahay abiyoonada taban waxay leeyihiin calaamada “–” oo lagu dhigayo tirada horteeda. Sidaa darteed, -3 waa abiyoono taban waxaa loo akhrin sida “saddex taban”.

Calaamad ma leh macnaheedu waa toгнаan

Haddii tirada horteeda ayna lahayn calaamada toгнаanta, macnaheedu waxaa weeye tiradu wey toгон tahay.

Tusaale: 5 run ahaan waa + 5 ama 5 waxaa loo akhrin sida “shan toгон| ama “shan”, 0 waa abiyoonaha laakiin ma aha mid toгон iyo mid taban toona. Waa tiro lagu cabiro madhnaanta; taas oo ah haddii tirada riyo cadkaadu ay tahay ebar, waxay ka dhigantahay wax riyo cad ah ma lihid. Haddii imtaxaanka aad uga jawaabtid si saxa waxay ka dhigan tahay ma lihid wax khalad ah ama jawaabaha khaladkaagu waa 0. Intaadan bilaabin tirsiga, natiijada waxaa laga soo qaadi ebar; midaas oo ah tirsiga alaabta, sheyga u horeeya intaadan tirsigiisa bilaabin waa ebar.

Fiiro gaar ah, hadeyna jirin wax alaab ah oo la tiriyo, natiijadu waa ebar.

Shaqo Kooxeedka 4.1

- 1 Magacaw labo xaaladood oo nolosha dhabta ah oo lagu isticmaalo abiyoonaha.
- 2 Magacaw lidka tirooyinkan abiyoonaha
-15, +44, +9, -53, 88, 17, -37.
- 3 Isticmaal jaantuska feen si aad u tustid xidhiidhka ka dhaxeeya ururada $\mathbb{N} = \{1, 2, 3, \dots\}$, $\mathbb{W} = \{0, 1, 2, 3, \dots\}$ iyo $\mathbb{Z} = \{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$.

Laylis 4.1

- 1 Qor abiyoonaha u taagan (matala) kuwan soo socda;
 - b** 210 fiit oo ka sareysa heerka badda.
 - t** 162 mitir oo ka hooseysa heerka badda.
 - j** 12 digrii oo ka hooseysa bar ku barfidda.
 - x** Khasaare 100 riyaal ah.
 - kh** Helitaanka 10 buundo oo natiijo imtaxaan ah.
 - d** 150 riyaal ood kala soo baxday bangiga.
 - r** 400 oo riyaal ood gashatay bangiga.
- 2 Qor lidka tirooyinkan abiyoonaha ee soo socda

| | | |
|-------------|-----------------|---------------|
| b 61 | t +73 | j 36°C |
| x 0 | kh -12°C | d -16 |

4.2 ISBARBARDHIGIDDA IYO HORSANAANTA ABYOONEYAASHA

Isbarbardhigida iyo horsanaanta abiyoneyaasha waxaad ku arki doontaa sida la isu barbardhigo labo abiyoneyaal oo lagu siiyay iyo tirooyin la calaamadiyay oo laga soo bilaabay tiro weyn una socota tiro yar iyo mid ka socota tiro yar una socota tiro weyn iyo iyada oo la isticmaalayo ama aan la isticmaaleynin xariiqa tirada.

i. Xariiqa tirada

Xusuusnaw abiyoonuhu waa tiro kastoo idil $\{0, 1, 2, 3, \dots\}$ ama lidkood.

Wadada ugu fiican isbarbardhiga abyoonaada waa isticmaalida xariiqa tirada, midkaa oo loo adeegsado in lagu soo bandhigo tirooyinka togan iyo kuwa taban oo lahabeeay. Xariiqa tirada dushiisa ku muuji barta tirada ebar (aas'aas ahaan). Tirooyinka toganee abiyoonaha waxay dhacaan dhanka midige ee ebarka iyo abiyoneyaasha tabanna waxay dhacaan dhanka bidixe ee ebarka. Xariiqa tiradu sidan buu u muuqdaa.



Jaantuska 4.3

Tirooyin badan (xad dhaaf ah) ayaa jira dhanka midig ee xariiqa tirada, waana tirooyinka ugu waaweyn. Tirooyin xad dhaaf ahna waxay jiraan dhanka bidix ee xariiqa tirada, waana kuwa ugu yar.

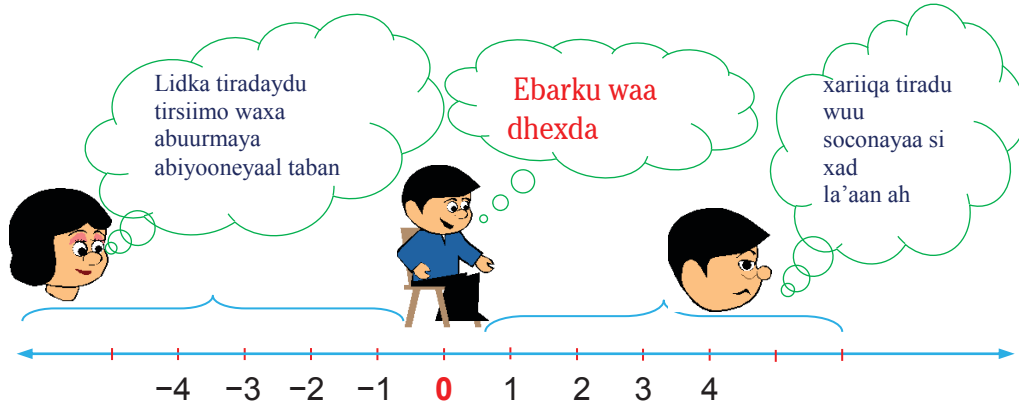
Hawlgalka 4.3

U qor tirooyinkan abiyone ee soo socda ado ka soo taxaya yaraantooda ilaa weynaantooda.

| | | | | | | |
|----------|---|------------|-----------|-----------|----------|------------|
| 1 | b | 0, -3, -5 | t | -7, 1, -2 | j | -8, -3, 0 |
| | x | 2, 4, 0 | kh | -5, 5, -9 | d | -1, -2, -3 |
| 2 | Adigoo ka bilaabaya ka ugu weyn ilaa ka ugu yar | | | | | |
| | b | -3, 7, 1 | t | 9, -9, 0 | j | 2, -2, -12 |
| | x | -9, -8, -7 | kh | 4, -4, 5 | d | -1, -10, 1 |

ii. Sawiritaanka xariiqa tirada

Xariiqa tirada waxaa lagu soo bandhigaa qaabka jiif ahaan. Xeer ahaan tirooyinka togan waxay dhacaan dhanka midig ee ebarka, iyo tirooyinka taban waxay dhacaan dhanka bidix ee ebarta. Falaadha labada dhinacba waxay tilmaameysaa xariiqi in uusan xad lahayn labada dhinacba oo uu soconayo.



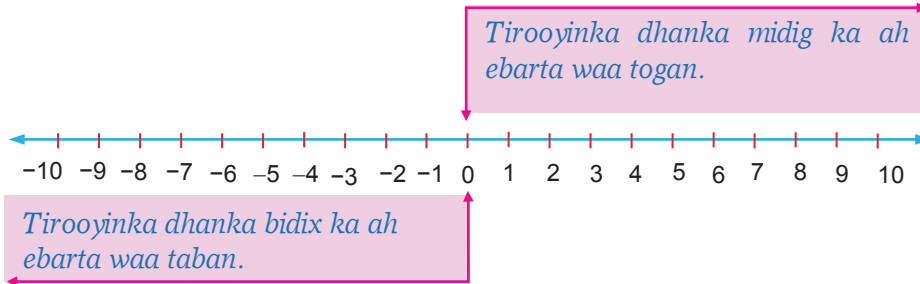
Jaantuska 4.4

iii. Isbarbardhiga abiyoonayaasha xariiqa tirada dushiisa



Jaantuska 4.5

Si aad isubarbardhigtid abiyoonaada xariiq tirada dushiisa, si fudud qiimahaada ugu meelee dusha xariiq, adigoo tirooyinka togan ku dhigaya dhanka midig ee ebarta kuwa tabana ku dhigaya dhanka bidix ee ebarta. Tirada sii xagta jirta dhanka midig waa tirada ugu weyn. Tirada dhanka bidix sii xagta jirtana waa tan ugu yar.



Jaantuska 4.6

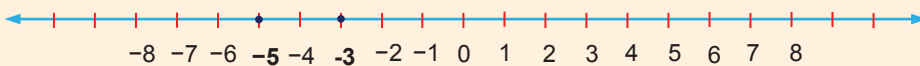
F.G: Marwalba labo tiro kasta oo ku yaala dusha xariiq tirada, tirada bidix waxay ka yartahay tirada midig.

Tusaale 1: keebaa weyn, -5 ama -3 ?

Furfuris:

Talaabada 1: Sawir xariiq tirada xulo barta (dhibicda) ebarta. Kadib, ku buuxi qiimaha abiyooneyaasha xariiq dushiisa.

Talaabada 2: Ku meelee abiyone yaasha aad tartansiineyso dusha xariiq tirada, maadaama labada tirooyinba ay taban yihiin, labaduba waxay ahaan doonaan dhanka bidix ee ebarta.



Jaantuska 4.7

Sidaad u aragtidba -3 xaga midig ayay ka xigtaa -5 , sidaa awgeed -3 wey ka weyn tahay -5 .

Maxaa sababay tirooyinka waaweyn ee taban in ay ka yaraadaan kuwa yar ee taban?

Waxaad u isticmaashaa tirooyinka waaweyn ee togan in ay macnaheedu tahay qiimahoodu in uu weyn yahay, tirada weyn, midda badan, ama sare, ama dheer, ama qaaliga ah ama wax walba oy tiradu u taagantahayba.

Markaan u soo kacno tirooyinka taban, waa in aad xusuusnaataa Markey gododku weynaadaan, tiradu wey yaraataa (sababto ah calaamada tabnaanta yaa tirada

horteeda ku qoran). Ka fakir tiradu waxay u taagan tahay, ka fakir qiimaheedu waxa uu yahay.

- ◆ Cadadka lacagta eed heshay wuu ka yar yahay inta badan eed amaahatayba.
- ◆ Heerkulku wuu sii yaraadaa, markii qabawgu sii bataba.
- ◆ Markii in badan aad qaadataba, wixii aad haysay wuu yaraadaa

Hawlgalka 4.4

Fiiri shaxdan soo socota waxay ku tusineysaa qiyaasta heerkulka celceliska ah ee sagaalka meerayaal dushooda.

| Meere | Dhul | Jubitar | Marsi | Meerkury | Nebtune | Bulut o | Satarn | Yuranas | Fen |
|--------------------------|------|---------|-------|----------|---------|------------|--------|---------|-------|
| Cel-celiska heerkulka | 8C° | -150C° | -37C° | 179C° | -225C° | -236C° | -185C° | -214C° | 453C° |

Ku tax meerayaashan shaxdan hoose ado u habeynaya meeshooda ugu kulul ilaa meeshooda ugu qabaw.

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |

Tusaale 2: -1 waxay ka weyn tahay -2 iyo waxay ka yar tahay 0 . Waxaynu u isticmaalnaa calaamada “ $>$ ” macno ahaan wey ka weyntahay iyo “ $<$ ” macno ahaan wey ka yartahay. Marka weedha sare waxaad u qori kartaa sida $-1 > -2$ iyo $-1 < 0$.

Dhammaan abiyoonada xariiqa tirooyinka dushooda waxay ku habeysan yihiin hab korodh ka bilawda bidix ilaa midig.

Waxaad xusuusan tahay xariiqa tirooyinka korkiisa, socodkaada dhanka midig tiradu wey kordheysaa iyo socodkaada dhanka bidix tiradu wey naaquseysaa.

Tusaale 3: habee abiyoonadan soo socda adoo ku bilaabay ka ugu yar, $-23, 17, -32, 2, -4, 0$.

Furfuris: ku bilaw adoo eegaya abiyoonayaalka taban sida ay marwalba uga yar yihiin abiyoonayaasha togan, ka bilaw abiyoonaha taban (-32) kaas oo leh qiimaha ugu yar.

Raadi kan ku xiga ee ah abiyoonaha taban ee ugu yar (-23) wada ilaa tirooyinka taban aad ka habeyneysid, markaa kadib ebarka iyo tirooyinka togan waxaa loo habeyni sidan soo socota $-32, -23, -4, 0, 2, 17$.

Tusaale 4: Abiyoonayaashan keebaa ka weyn -6 laakiin ka yar 4?

-8, -10, 5, -4, 0

Furfuris: Ku bilaw adoo raadinaya dhammaan abiyonada ka yar -6. waxaad heleysaa markaad eegto xariiqa tirada in -8 iyo -10 ay ka xigaan dhanka bidix -6. Marka ku xigta ka saar wax alla wixii ka weyn 4. Kaasi macnihiisu 5 ayaa ka baxeysa. Sidaa darteed, jawaabtu waxay noqon -4 iyo 0.

Laylis 4.2

1 Tilmaan abiyoonadan soo socda meesha ay kaga yaalaan xariiqa tirada ee hoose, kadib tax adoo ka bilaabaya kooda ugu yar ilaa kooda ugu weyn. 5, -3, 6, -5, 3, -8, 8, -9



Jaantuska 4.8

2 Qor lidka mid walba oo ka mid ah abiyoonayaashan soo socda

b 16 **t** -7 **j** -13 **x** 18

3 Qor mid walba oo ka mid ah abiyoonayaashan urursan adoo u habeynaya (u taxaya, dhanka midka ugu yar ilaa midka ugu weyn).

b 8, -9, -12, 0, -11, 15, 12

t 17, -5, -7, -12, 0, 4, -13, 6

j -28, 27, -30, 3, -31, -33

4 Qor mid walba oo ka mid ah abiyoonadan urursan adoo ka bilaabaya midka ugu yar ilaa midka ugu yar.

b -21, 16, -8, 14, 21, 0, 22

t 24, 14, -14, -22, 10, 0, -20

j 11, -1, 10, -13, -19, -9, 9

4.3 ISUGEYNTA IYO KALA GOYNTA ABYOONEYAASHA

Qeybtan waxaad ku baran doontaa sida la isugu daro iyo sida loo kala jaro abiyoonayaasha ama ha ahaadaan isku calaamad ama ha kala duwanaadaan.

Waxaadna kalood arki doontaa faraqa u dhaxeeya calaamada ku darta iyo calaamada “ka jarta”, calaamada “taban” iyo calaamad “togan”.

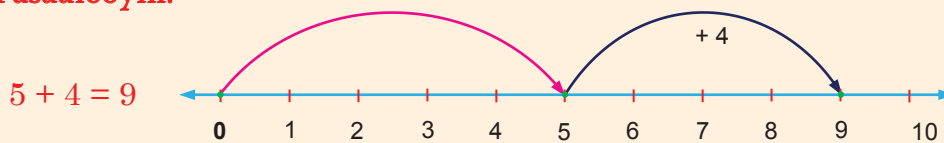
Hawlgalka 4.5

- 1 Ka soo qaad waxaad rabtaa in aad iibsatid buug qiimihiisu yahay 63 riyaal. Haddii aad haysid 35 riyaal kali ah, imisa lacag oo dheeraad ah yaad u baahan tahay si aad u gadatid buuga?
- 2 Maxay tahay in lagu daro 44 si aad u heshid wadarta 73?
- 3 Diwaanka la hayey ee heerkulkii ugu sareeyey ee Debre Birhan sannadii 1997 wuxuu ahaa 27 digrii, heerkii ugu hooseeyey ee la diiwaan galiyeyna wuxuu ahaa -8 digrii waa maxay faraqa heerkulka sare iyo ka ugu hooseeyey?

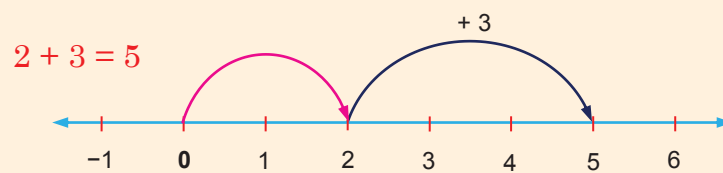
Laga yaabo xariiqa tirada in uu yahay wadada u fudud muuqaalkana leh ee loogu isticmaalo isku darka iyo kala jarka abyoonayaasha.

Sidaad ku soo aragtay kor iyada oo dhanka midig loo raaco xariiqa tirada waa isku dar.

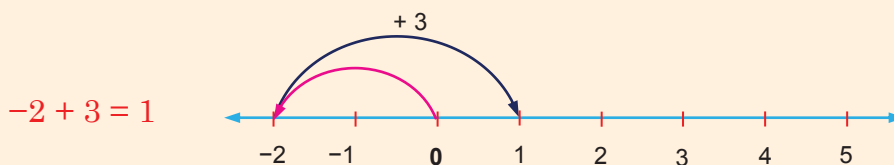
Tusaalooyin:



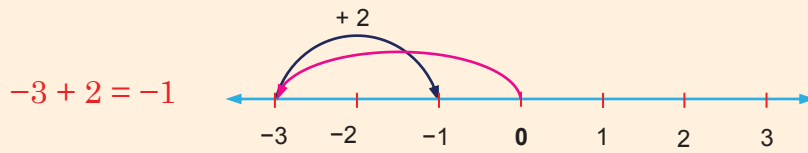
Jaantuska 4.9



Jaantuska 4.10

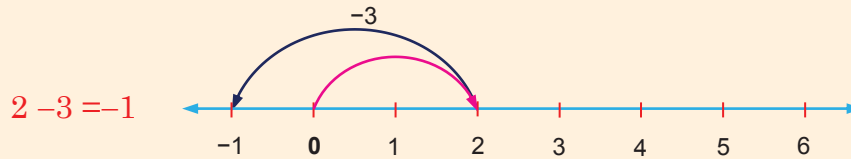


Jaantuska 4.11

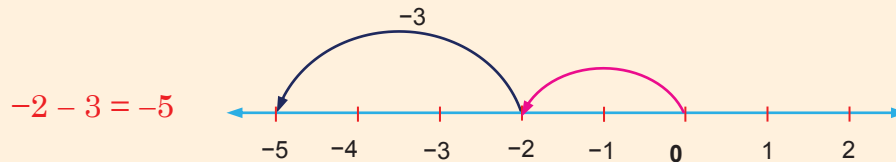


Jaantuska 4.12

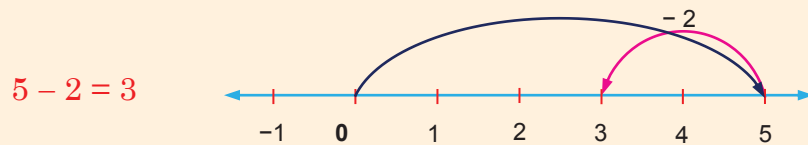
Dhanka kale xariiqa tirada oo loo raaco dhanka bidix waa ka jar sida hoos lagu tusay.



Jaantuska 4.13



Jaantuska 4.14



Jaantuska 4.15

I. Iskudarka Abiyoonaada Togan

Iskudarka tirooyinka togan waa iskudarka caadiga ah.

Tusaale 1: $3 + 5 = 8$, run ahaantii waxaa la dhihi saddex togan lagu daray 5 togan waxay la mid tahay 8.

Waxaad u qori kartaa sida $(+3) + (+5) = (+8)$.

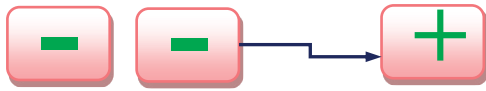
II. Kala jarida Abyoonaaha togan

Kala jarida abyooneyaasha togan waa kala jarida caadiga ah.

Tusaale 2: $9 - 6 = 3$, run ahaantii waxaa loo akhrin “9 togan laga jaray 6 togan waxay la mid tahay 3 togan”, waxaa loo qori karaa sida

$(+9) - (+6) = (+3)$ laakiin maxaa dhacaya haddii aan haysano tirooyin taban?

Tusaale ahaan, waa maxay $6 - (-3)$?



Abiyoone laga jaray tiro taban waxay lamid tahay abiyoonihii oo lagu daray tabanaha lidkiisa.

Hawlgalka 4.6

Xisaabi kuwan soo socda

b $3 - 3$ **t** $5 - 2$ **j** $4 - 7$

Ogow:

- i** laba Abyoone oo kasta oo b iyo t ah, haddii $b = t$, dabadeed $b - t = 0$
- ii** laba Abyoone oo kasta oo b iyo t ah, haddii $b > t$, dabadeed $b - t > 0$
- iii** laba Abyoone oo kasta oo b iyo t , ah haddii $b < t$, dabadeed $b - t < 0$
- iv** Abyoone kasta oo b , ah
 - ◆ $b + 1$ waxaa la yidhaa ka dambeeyaha b .
 - ◆ $b - 1$ waxaa la yidhaa ka horeeyaha b .

Tusaale 2:

- i** Ka dambeeyahs 4 waa 5, waayo $4 + 1 = 5$ ka horeeyaha 4na waa 2 waayo $4 - 1 = 3$
- ii** Ka dambeeyaha -6 waa -5 waayo $-6 + 1 = -5$, ka horeeyu huna waa -7 waayo $-6 - 1 = -7$

Tusaale 3: Ruqiya waa gabadh dhexdhaxaad ah, waxay dhigataa fasalka 6aad. Waxay noqon kartaa gabadh liidata oo anshax leh ama fiican. Sidaa darteed, waalidka Ruqiya waxay dhaheen; “haddii aad fiicnaatid waxaanu kuugu dari 3 buundo (+3). Haddii aad marjo noqotidna waxaanu kaaqaadi saddex dhibcood. Marka aad gaadhid 30 dhibcood waxaad heli abaalmarin.

Ruqiya waxay maalinkii ku bilawday iyada oo haysata 9 dhibcood.

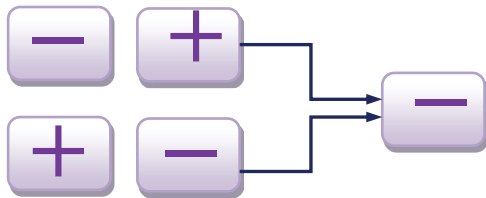
| | |
|---|---|
| Buundooyinka Ruqiya 9 $9 - 3 = 6$ Maqabsoona $6 + 3 = 9$ | Ruqiya hooyadeed waxay baadhay in caano daateen kadib waxay ka qaaday saddex dhibcood; $9 - 3 = 6$ Kadib Aabaa xaqiijiyay in uu isagu daadiyay caanaha. Kadib hooyaa xisaabisay: $6 + 3 = 9$ |
|---|---|

Maxaa dhacaya haddii la isku daro ama la kala jaro abyooneyaasha taban iyo kuwa togan?

Waxaa kaloo jiri kara su'aalahan;

Waa maxay $6 + (-3)$? ama waa maxay $6 - (+3)$?

Run ahaantii waa isku mid; labaduba waa kala jarid.



Kagoynta tiro togan ama ku darista tiro Tabani waa kalajarid.

Buundooyinkii Ruqiya:12

$$12 + 3 = 15$$

Ma'qabsoomo! (mafuliqn)

$$15 - (+3) = 12$$

$$+3 \quad 12 + (+3) = 15$$

$$-3 \quad 12 + (-3) = 12$$

Maalmo yar kadib, Ruqiya waxay haysataa 12 dhibcood. Hooyo waxay ku biirisay 3 dhibcood sababtoo ah qolka Ruqiya waa nadiif.

Aabo wuxuu yidhi “qolkaa anaa nadiifiyay” wuxuuna qoray “ma qabsoono”.

- ♦ Hooyo waxay xisaabisay:
 $15 - (+3) = 12$
 Aabo wuxuu arkay Ruqiya oo baraarkii meydhaysa, wuxuuna qoray “+3”.
- ♦ Hooyo waxay xisaabisay:
 $12 + (+3) = 15$
 Ruqiya waxay dhagax ku xoortay daaqada
 Aabo wuxuu qoray “-3”.
- ♦ Hooyo waxay xisaabisay
 $15 + (-3) = 12$

Fiiri natiijada labadaba

“ $15 - (+3)$ ” iyo “ $15 + (-3)$ ” waa 12 kaas oo ah $15 - 3$.

Sidaa darteed, wax dhib ah ma laha hadaad kala jartid dhibco togan ama isugeysid dhibco taban, waxaad tahay mid dhibco waayaya (luminaya).

Hadda, halkan waxaa ah xeerar

| Xeer | Tusaale | |
|--|-------------|------------------------|
| Labadii calaamadood ee isku eeg waxay yeeshaan calaamad togan. | $+(+) = +$ | $3 + (+2) = 3 + 2 = 5$ |
| | $-(-) = +$ | $6 - (-3) = 6 + 3 = 9$ |
| Labadii calaamadood eek ala duwan waxay yeeshaan calaamad taban. | $+(-) = -$ | $7 + (-2) = 7 - 2 = 5$ |
| | $- (+) = -$ | $8 - (+2) = 8 - 2 = 6$ |

Tusaale 4: waa maxay $5 + (-2)$?

Furfuris: Inaga oo ka duuleyna kor: $+ (-)$ waxay noqotaa calaamad taban.

$$5 + (-2) = 5 - 2 = 3$$

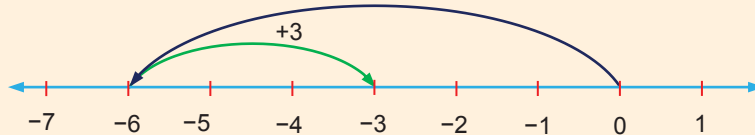
$$5 + (-2) = 3$$

Tusaale 5: Waa maxay $-6 + (+3)$?

Furfuris: Xagga sare waxan ku aragnay in $+(+)$ ay noqonayso calaamad togan $-6 + (+3) = -6 + 3$

Ka bilow -6 xariiqda tirada dusheeda, u soco dhinaca midigta 3, waxaad dul-joogsan -3 .

Furfuris: $-6 + (+3) = -3$.



Jaantuska 4.16

Eeg calaamada '+' waxaa loo isticmaalaa siyaabo kala duwan

- i Markii lagu hordhigo tiro waxay tilmaantaa tiradu in ay togan tahay. Sidaa darteed, $+5$ macnaheedu waxaa weeye 5 waa togan.
- ii Markii la dhex dhigo labo tiro dhexdood, macnaheedu in la isku daro tirooyinka. Sidaa awgeed, $3 + 4 = 7$, loona akhriyo sida 3 lagu daray 4.

Sidoo kale calaamada "-" waxaa loo isticmaalaa siyaabo kala duwan.

- i Marka lagu hordhigo tiro, macnaheedu tiradu waa taban. Sidaa darteed, -4 macnaheedu waxay tahay tirada 4 waa taban.
- ii Markii lagu dhex qoro labo tiro dhexdood, waxay tilmaameysaa tirooyinka in lakala jaro. Sidaa darteed, $2 - 9 = -7$, waxaa loo akhriyaa 9 laga jaray 2.

Tirada 0 waxay leedahay dabeecadahan soo socda ee waxtarka leh.

- i Tiro walba oo abiyoona a , $a + 0 = a$, tirada 0 waxaa loogu yeedhaa xubinka asalmadoorshaha isugeynta.
- ii Tiro walba oo abiyoona a , waxaa jira abiyoone $-a$, kaas oo $a + -a = 0$. Tirada $-a$ waxaa loogu yeedhaa lidka a .

Tusaale 6:

- i $-5 + 5 = 0$, sidaa darteed, -5 waa lidka 5, sidoo kale 5 waa lidka -5 .
- ii $12 + (-12) = 0$, 12 waa lidka -12 , sidoo kale -12 waa lidka 12.

F.G: Su'aasha $9 - 6$ waxay lamacno tahay $9 + (-6)$, sababtoo ah $9 - 6 = 3$ iyo waliba

$9 + (-6) = 3$, waxaa la mid ah, $13 - 7 = 13 + (-7) = 6$, tan markaa waxay kuu horseedi fakhir ah su'aasha kala goynta abiyoona waxaa kaloo la fakhir ay tahay su'aalaha isugeynta.

Sidaa awgeed, kala jarka labo abiyoonaha waxay la mid tahay isku darka lidka abiyoonaha 2aad uu ku yahay abiyoonaha 1^{aad}.

Haddii a iyo b ay yihiin labo abiyoonaha, si aan b uga jarno a , waxaynu badaleynaa calaamad b markaasaanu ku dari a .

Taas oo noqon,

i $a - b = a + (-b)$

ii $a - (-6) = a + b$

Laylis 4.3

- 1 U qor tirooyinkan ururo ee soo socda hab taxa ay naaqusayaan

| | |
|---------------------------------|--------------------------------------|
| b -9, -4, 4, 0, -3, 8 | t -7, -11, -3, -5, 1, 0, 2, 6 |
| j 3, 12, -5, -3, 3, 8, 6 | x 0, 7, -5, -7, 2, 10, -3, -6 |
- 2 Isu – gee midkasta oo ka mid ah kuwan soo socda

| | | |
|----------------------|-----------------------|------------------------------|
| b (+3) + (+3) | t (-5) + (+7) | j (+8) + (-8) |
| x (+6) + (-9) | kh (-7) + (-7) | d (-9) + (-8) + (+10) |
- 3 Kala midkasta oo ka mid ah kuwan soo socda

| | |
|------------------------------|-----------------------------|
| b 18 laga jaray 9 | t 9 laga jaray 18 |
| j 6 laga jaray 14 | x -12 laga jaray -21 |
| kh -21 laga jaray -12 | d -15 laga jaray -8 |
- 4 Raadi ka horeeyaha iyo ka dambeeyaha midkasta ooka mid ah Abyooneyaashan

| | | |
|---------------------|-----------------------|---------------------|
| b ___ 3 ___ | t ___ -9 ___ | j ___ 19 ___ |
| x ___ -1 ___ | kh ___ -10 ___ | d ___ 0 ___ |
- 5 Isticmaal xariiqda tirada si aad si sax ah u dhigtid calaamada $>$ (ka weyn), $<$ (ka yar) Ama = (lamid) laba lammaaneyaal kasta oo tirooyinkan soo socda ah.

| | | |
|----------------------|-----------------------|-----------------------|
| b 10 ___ 14 | t -3 ___ -5 | j 6 ___ -4 |
| x -15 ___ 13 | kh -10 ___ -10 | d 76 ___ 67 |
| r -37 ___ -73 | s -46 ___ -85 | sh -2 ___ -202 |
- 6 Raadi qiimaha kuwan soo socda

| | |
|-------------------------|---------------------------|
| b (-23) + (-12) | t (-3) - 7 - (-19) |
| j 12 + (-33) - 3 | x -42 - (21) + 5 |
| kh 8 - 5 - 6 | d 24 - (-24) |
- 7 Ku buuxi meelaha bannaan “ $>$ ” ama “ $<$ ”

| | |
|-------------------------------------|----------------------|
| b -8 ___ 8 | t -17 ___ 71 |
| j -63 ___ -36 | x -(-8) ___ 0 |
| kh (-17) - 17 ___ 17 - (-17) | |

☞ Hubin

☞ Abiyoonada

☞ Hab naaquska

☞ Isbarbardhiga abiyoonada

☞ Iskudarka lidka

☞ Ka horeeyaha

☞ Lidka

☞ Tirooyinka togan

☞ Hab kororka

☞ Habeynta abiyoonada

☞ Iskudarka abiyoonada

☞ Ka danbeeyaha

☞ Kala goynta abiyoonaha

☞ Tirooyinka taban

☞ Xubinka asalmadoorshaha



Soo Koobidda Cutubka

- 1 Ururka tirooyinka ee ka kooban tirooyinka idil iyo kuwa taban waxaa loogu yeedhaa ururka abyoonada. Calaamadiisu waa \mathbb{Z} oo loo qoraa $\mathbb{Z} = \{\dots, 3, -2, -1, 0, 1, 2, 3, \dots\}$.
- 2 Xariiqa tirada labada jahooyinba si aan xad lahayn buu ugu socdaa. Midaas oo lagugu tuso falaadhaha kaga yaala labada cidhif.
- 3 Tirooyinka idil ee ka wayn ebarka waxaa loogu yeedhaa abiyoonada togan. Tirooyinkaas oo kaga yaala xariiqa tirada dhanka midig ebarka.
- 4 Tirooyinka ka yar ebarka waxaa ladhahaa abiyoonada taban. Tirooyinkaas waxay xariiqa tirada kaga yaalaan dhinaca bidix ee ebarka.
- 5 Abiyoonaha ebarku waa dhex-dhexaad mid togan iyo mid taban toona ma aha.
- 6 Calaamada abiyoonaha waa togan ama taban ($-$), waxaan ka ahayn ebar, taas oon lahayn wax calaamad ah.

- 7 Labadii abiyoone waxay isku yihiin lid hadey fogaantooda ay u jiraan ebarka ay isku mid tahay laakiin ay ku kala yaalaan labada dhinac ee xariiqda tirada. Mid wuxuu yeelan calaamad taban kan kalana calaamad togan.
- 8 Isticmaal xariiqda tirada marka aad iskudareysid iyo marka aad kala jareysidba.
- ◆ Iskudar tirooyinka abiyoonaada togan ado xariiqda tirada u raacaya dhanka midig.
 - ◆ Iskudar tirooyinada abiyoonaada taban ado xariiqda tirada u raacaya dhanka bidix.
 - ◆ Kaljar abiyoonaayaasha ado ku daraya lidkiisa.
- 9 Labo walba oo abiyoonaada a iyo b haddii
- ◆ $a = b$, kadib $a - b = 0$
 - ◆ $a > b$, kadib $a - b > 0$
 - ◆ $a < b$, kadib $a - b < 0$
- 10 abiyoone kasta oo ah a
- $a + 1$ waxaa loogu yeedhaa ka dambeeyah a .
- $a - 1$ waxaa loogu yeedhaa ka horeeyah a .

Layliska Nakhtiinka Cutubka 4^{aad}

- 1 Heerkulka Addis-Ababa dhexdeedu waa 22°C sentigiraydh iyo kaa dhebrasayd gudaheeda ahna waa -9°C selshiyas. Waa maxay faraaqa u dhaxeeya heerkuladaa?
- 2 Gujis ayaa wuxuu ku sugnaa 137 mitir oo ka hooseeysa heerka badda, hadii uu sii dago 91 mitir, waa maxay meesha cusub ee uu tagay?

3 Xaliimo ayaa waxay amaahisay waardiyaheedii lacag 33 riyaal ah haddii ay hooyadeed ka bixiso 15 riyaal waardiyaaha, Imisa lacag ah ayaa ku hadhay waardiyaahii?

4 Qor tirada u taagan xaalad kasta.

| Xaalad | Qiimaha tirada |
|---|----------------|
| 9 dhigrii oo ka sareysa ebar | |
| 54 mitir oo ka sareysa heerka badda | |
| 12 halbeeg oo kaga taala dhanka bidix xariiq tirada | |
| 860 riyaal ood ku keydsatid bangiga | |
| 45 riyaal ood heshid | |
| Lidka 181, | |
| 8 halbeeg oo dhanka bidix ee 1 kagayaala xariiq tirada. | |

5 Qor lidka mid walba oo ka mid ah abiyoonayaashan soo socda:
14, 91, -65, 3, -12, 0, -23.

6 Qor mid walba oo ka mid ah abiyoonayaashan soo socda adoo ka bilaabaya kooda ugu yar ilaa ka ugu weyn.

b 34, -37, 58, 16, -43, 36, -85

t 29, 19, 16, -22, -4, -10, -27, 0, -29

j 12, -14, 16, -18, -22, -41, -8, 20

x 48, 46, 41, -13, -31, -35, -53.

7 Qor mid walba oo ka mid ah abiyoonayaashan soo socda adoo ka bilaabaya kooda ugu weyn ilaa ka ugu yar.

- b** 15, -27, 11, -41, 33, -19, 77,
t -1, -4, -13, 42, 29, 72, 46, -43
j 81, -63, -17, 26, 31, -5, -69
x -34, -45, -56, 55, 61, 9, 53, 40, 33.

8 Heerkulka xiliga hadhgalka karanta wuxuu ahaa 8° sentigiraydh. Badhtamaha habeenka, heerkulku wuxuu hoos u dhacay 11° sentigiraydh. Muxuu ahaa heerkulka saqda dhexe ee habeenkaa?

9 Iskudar kuwan soo socda

- b** $-5 + 47$ **t** $27 + 14$ **j** $18 + -45$
x $-47 + -44$ **kh** $-23 + 32$ **d** $-1 + 59$

10 Kala jar kuwan soo socda

- b** $-25 - 47$ **t** $44 - 14$ **j** $-16 - (-61)$
x $-71 - 42$ **kh** $34 + -17$ **d** $-1 - 49$

11 Raadi tirada maqan

- b** $28 + \underline{\hspace{1cm}} = 43$ **t** $41 \underline{\hspace{1cm}} - 41$ **j** $-13 \underline{\hspace{1cm}} - 31$
x $-(-2) \underline{\hspace{1cm}} 2$ **kh** $6 - (-6) \underline{\hspace{1cm}} -6 - (-6)$
d $4 + (-4) \underline{\hspace{1cm}} 0$

12 Ku buuxi meelaha banana calaamadahan “>”, ama “<”

- b** $-9 \underline{\hspace{1cm}} 6$ **t** $-17 \underline{\hspace{1cm}} 71$ **j** $-63 \underline{\hspace{1cm}} -36$
x $-(-8) \underline{\hspace{1cm}} 0$ **kh** $(-17) - 17 \underline{\hspace{1cm}} 17 - (-17)$.

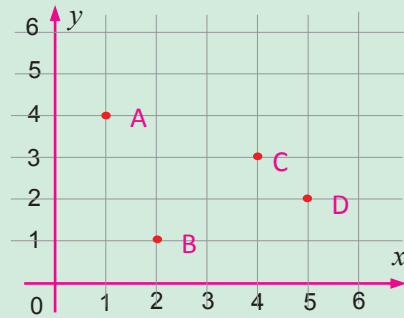
13 Faadumo waxay leedahay lo’ midabkeedu kala yihiin 12 casaan ah, 8 madaw ah iyo 6 cadaan ah

b Raadi wadarta tirada lo’da ay leedahay faadumo?

t Imisa sac yaana ahayn madaw?

14 Ilbaxnimadii boqortooyadii Ruum waxay bilaabatay 509 Ciise ka hor waxayna dhamaatay 476 Ciise kadib. Imisa sano ayay boqortooyadii Room ay jirtay?

CUTUBKA 5aad



ISLE'EGYADA TOOSAN, DHEELIYADA IYO SAAMIGALNIMADA

Maxsuulka Cutubka:

Cutubkan dabadii, ardaydu waxay awoodi doonaan inay;

- ➔ *horumariyaan xirfadahooda xalinta isle'egyada toosan iyo dheeliyada (ee qaabka $x + a = b$, $x + a > b$)*
- ➔ *fahmaan fikradaha saamiyada qumman iyo rogaalka iyo sida ay garaaf ahaan ugu taagan yihiin ama u metalayaan*

Tusmooyinka ugu muhiimsan:

5.1 Xalinta ama furfurista isle'egyada iyo dheeliyada

5.2 Dhidibada

5.3 Saamigalnimada

Hubin

Soo koobidda cutubka

Layliska nakhtiinka

HORDHAC

Cutubkan waxaad kaga qayb geli doontaan aqoontiinii hore ee aad u lahaydeen ee isle'egyada toosan iyo dheeliyada oo ah kuwo doorsoome leh barashada sida ay ugu taagan yihiin lammaanyaasha horsan ee aan ahayn tirooyinka lakab ee taban ee baraha dhidibada kaartis ee ku yaal sallax laydi ah, iyo barashada fikrada saamigal-qumman saami-rogaal iyo isirkooda saami galnimo.

5.1 FURFURISTA ISLE'EG YADA IYO DHEELLIYADO TOOSAN EE FUDUD

Sidii aad ku soo barateen casharadii iyo fasaladii hore, waxaad dib u xasuusataan ururadan soo socda.

$$\mathbb{N} = \{1, 2, 3, \dots\}$$

$$\mathbb{W} = \{0, 1, 2, 3, \dots\}$$

$$\mathbb{Z} = \{\dots, -2, -1, 0, 1, 2, \dots\}$$

$$\mathbb{Q} = \left\{ \frac{a}{b} : a \in \mathbb{Z}, b \in \mathbb{Z} \text{ oo } b \neq 0 \right\}$$

Fasalkii 5^{aad} waxaad ku soo barateen isle'egyada iyo dheeliyada. Casharkanna waxaad ku baran doontaan qaar ka badan oo ku saabsan isle'egyada toosan oo aad ku baranaysaan qaar kamid ah, xeerarka furfurista qaabka cusub ee isle'egta

Waxaad sidoo kale kaga qayb-gelaysaan aqoon horumarsan markan sida loo furfuro isle'egyada, iyo sida loo furfuro dheeliyada leh hal doorsoome.

5.1.1 Ku furfurista hal talaabo isle'egtoosan

Shaqo Kooxeedka 5.1

- 1 U falanqeeya kooxo ahaan ereyadan soo socda:

| | |
|--------------------------------|----------------------------|
| b Doorsoome | t Isle'eg |
| j Isle'egyo iskudhigma | x Isle'eg toosan |
| kh horaadka doorsoomaha | d ururka furfurista |
- 2 Adigoo ku badalaya qiimeyaasha tirooyinka lagu siiyey, Raadi qiimaha x ee isle'egta lagu siiyey ka dhig aya weedh run ah

| | |
|--|---|
| b $x + 3 = 5, x \in \{-2, -1, 0, 2, 5, 7\}$ | t $x - 6 = 12, x \in \left\{0, \frac{1}{2}, 1, \frac{3}{2}, 5\right\}$ |
|--|---|

| | | | |
|-----------|---|----------|---|
| j | $9 - x = 7, x \in \{1, 2, 3, \dots, 20\}$ | x | $x + 4 = 4, x \in \mathbb{W}$ |
| kh | $x + 45 = 55, x \in \{-1.1, 3, 6.7, 10, 11.2\}$ | d | $x + \frac{4}{5} = \frac{9}{5}, x \in \mathbb{N}$ |

Xisaabtii aad ku soo barateen fasalka 5^{aad} markaad dib u xasuusataan inay isle’egtu la mid tahay miisaanka ama cabbirka isku dheelitirka. Waxaad ogsoon tihiin inay isle’egtu leedahay dhinaca bidix oo had iyo jeer le’eg ama la mid ah dhinaca midig Tixgeli isle’egta $x + 3 = 6$. Hada hubi miisaanka lagu siiyay ee hoos ku xusan.



Jaantuska 5.1

Culayska miisaankan ee leh halka sanduuq ee afargeeska ah (laba jibaaranaha) iyo 3da kubadood ee yaryar ee saaran dhinaca gacanta midig Culayska miisaanku wuu iskudheelitiran yahay. Tusaale culayska saaran Dh. G.B wuxuu la mid yahay culayska saaran dhinaca gacanta midig Hadii aad ku meteshid sanduuqa afargeeska oo aad u qaadatid doorsoomaha x , kubad kastana ka dhigtid tiro 1, kadib culayska miisaanku wuxuu u taagnaan doonaa isle’egtani $x + 3 = 6$. Furfurista isle’egtani waxay la mid tahay raadinta culayska sanduuqa afar geeska ah ee saaran miisaanka. Si aynu u Helno culayska sanduuqa ku dhexjira kubadaha, waxaad ka qaadaa saddexda (3) kubadood dhanka bidix Laakiin miisaanku wuu janjeersamayaa. Sidaa darteed si aad u adkaysaan iskudheelitirka waa inaad tiro isku mid ah ka qaadaan labada dhinacba (Tusaale, 3 kubadood). Sidaa awgeed \square afargeeska ahi waxay isku dheelitirmayaan 3 kubadood, sidaa darteed $x = 3$ oo xalka ama furfurista isle’egta $x + 3 = 6$.

Waxaad ku soo gabagabayn kartaan in haddii wax kasta ama tiro kasta aad ka qaadaan hal dhinac, waa inaad ka qaadaan tiro la mid ah dhinaca kale sidaa darteed isle’egta aynu sare ku soo xusnay waxaan mar kale u qori karnaa:

$$x + 3 = 6$$

$$x + 3 - 3 = 6 - 3 \text{ (ka jar tiro isku mid ah labada dhanba)}$$

$$x = 3$$

Tusaale 1: furfur isle'egta $x - 6 = 11$ oo ah tiro idil (W)

Furfuris: raadinta ururka furfuristooda oo ah $\{17\}$.

Maadaama dhinaca bidix uu muujinayo farqi, waxaynu labada dhinacba ku dari 6 ee isle'egta si aynu u go'aansano qiimaha doorsoomaha.

Taas oo ah, $x - 6 = 11$

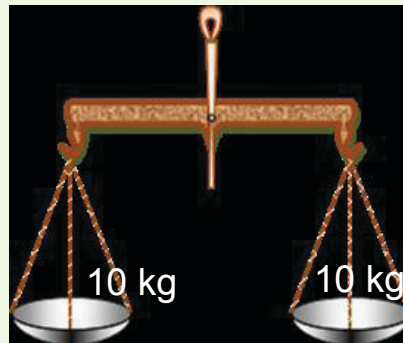
$$x - 6 + 6 = 11 + 6$$

$$x = 17$$

Markii aad ku bedeshid $x = 17$ isle'egta asalkeedii waxay ku siinaysaa weedh run ah. Sidaa darteed ururka furfuristu waa $\{17\}$.

Hawlgalka 5.1

Ka soo qaad in cufka hal dhinac ee kafada ama miisaanka uu la mid yahay cufka dhinaca kale ee kafada ama miisaanka sidaas darteed cabbirkaasi waa isku dheeli-tiran yahay.



Jaantuska 5.2

- b** Haddii aad ku dartid kafada ama birta dhanka bidix cuf dhan 3kg, Maxaad ku samayni kafada dhanka midig si uu miisaanku unoqdo mid isku dheeli-tiran?
- t** Haddii aad 3kg ka qaadid kafada dhanka bidix, maxaad ku samayni kafada dhanka midig si uu miisaanku u noqodo mid isku dheeli-tiran?

Hawlgalkan sare, waad hubin kartaa in aad adkayso ama Xoojiso isku dheeli-tirnaanta miisaanka isbedel isku mid ah ayaa ku dul samaysmaya kafadaha labada dhinacba. Haddii kale miisaanku noqon maayo mid isku dheeli-tiran. Ka shaqaynta isle'egyadu waa kuwo ku salaysan xeerar isku mid ah. Si aynu u furfurno isle'eg layna siiyay doorsoome, waa inaad dib u habaysaa isle'egta lagu siiyay si tallaabo-tallaabo ah, ilaa iyo inta aad ka helaysid isle'egta qaabkan leh $x = a$ (a ay tahay madoorsoome) kaas oo loo yaqaano qaab bedelida.

Xeerarka Qaab-bedelka

- 1 Haddii aad ku dartid tiro isku mid ah labada dhinac ee isle’egta, kolkaa isle’egta cusub ee aad heshay waxay u dhigantaa midii asalka ahayd.
Tusaale: Haddii $x = a$, kolkaa $x + b = a + b$ tiro kasta oo ay a iyo b yihiin
- 2 Haddii aad ka jarto tiro isku mid ah labada dhinac ee isle’egta, kolkaa isle’egta cusub ee aad heshay waxay u dhigantaa midii asalka ahayd.
Tusaale: Haddii $x = a$, kolkaa $x - b = a - b$ tiro kasta oo ay a iyo b yihiin

Tusaale 2: $x + 8 = 5$, furfur x haddii

b Horaadku uu yahay ururka abyooneyaasha

t Horaadku uu yahay tirooyinka tirsiiimo

Furfuris: Waxaad xasuusataan xisaabtii Fasalka 5^{aad} in horaadka doorsoomuhu yahay ururka kaas oo ku tirsaneyaashiisa loo tixgeliyay in ay sida ugu suuro galsan u bedelaan booska doorsoomaha lagugu siiyay isle’egta, sidaas awgeed furfurista isle’egtu waa mid ku xiran horaadka lagu siiyay.

Sidaa awgeed, **(b)** $x + 8 = 5$

$$x + 8 - 8 = 5 - 8 \text{ (Waayo?)}$$

$$x = -3$$

Markaa $-3 \in \mathbb{Z}$, ururka furfuristu waa $\{-3\}$ marka uu horaadku yahay ururka Abyooneyaasha.

(t) Haddii uu horaadku yahay ururka tirooyinka tirsiiimo, kolkaa isle’egtu furfuris ma yeelanayso (Waayo?)

Guud ahaan, waxaynu ku soo gabagabaynaynaa qodobadan soo socda:

Ka soo qaad in lagu siiyay isle’eg waxaad dib ugu habayn kartaa qaabka $x = a$ (a oo ah madoorsoome) u adeegso xeerka qaab – bedelka.

- ♦ Haddii “ a ” ay tahay ku tirsanaha horaadka, kolkaa ururka furfuristu waa $\{a\}$
- ♦ Haddii “ a ” ayna ahayn ku tirsanaha horaadka, kolkaa isle’egtu malaha furfuris.

Tusaale 3: Ka soo qaad inaad ku fikiraysay hal Tiro, haddii aad tiradaadaa 13jeer yaraysid natiijada aad helaysaana noqon doonto 36.

Maxay ahayd tiradii aad ku fikiraysay?

Furfuris: Si aad u furfurto ama xaliso masalada noocan ah, ee weedh hadal ahaaneed waxay u baahan tahay in loo bedelo weedh xisaabeed ahaan.

Bal x ha noqoto tiradii asalka ahayd ee aad ku fikiraysay

Kolkaa, $x - 13 = 36$ (Waayo?)

$$x - 13 + 13 = 36 + 13 \text{ (Waayo?)}$$

$$x = 49$$

Sidaa darted tiradii aad ku fikiraysay waa 49

Qeexid: Isle'egyada leh ururka furfurista ee isku midka ah ee horaadka lagu siiyay waxaa loo yaqaanaa isle'egyada isku dhigma.

Tusaale ahaan, $x - 5 = 9$ iyo $x = 14$ waa isle'egyo isku dhigma. Ka warran $13 - x = 7$ iyo $x = 6$?

Laylis 5.1

- Mid kasta oo ka mid ah tirooyinkan soo socda ku bedel 6, 0.4, -5 iyo $\frac{3}{4}$ meesha doorsoomaha, hubina hadii ay weedhu run ama been tahay.

| | | | | | |
|----------|--------------------------|-----------|------------------------------------|----------|------------------|
| b | $x + 0.75 = \frac{3}{2}$ | t | $-y - 5 = 0$ | j | $4.56 - x = 4.6$ |
| x | $\frac{11}{2} - x = 5.1$ | kh | $2\frac{1}{2} - x = -3\frac{1}{2}$ | | |
- Mid kasta oo ka mid ah isle'egyadan soo socda, u raadi saddex isle'eg oo u dhigma

| | | | | | | | |
|----------|----------------------------------|----------|----------------|----------|-------------------------|----------|---------|
| b | $x - \frac{1}{2} = \frac{-7}{2}$ | t | $-x - 3 = 4.5$ | j | $1\frac{1}{2} + y = -2$ | x | $x = 9$ |
|----------|----------------------------------|----------|----------------|----------|-------------------------|----------|---------|
- Furfur doorsoomaha hadii horaadku uu yahay ururka tirooyinka idil

| | | | | | |
|----------|---------------|-----------|-----------------|----------|---------------------------------|
| b | $y + 3 = 1$ | t | $-4 + x = 10$ | j | $y + \frac{2}{5} = \frac{2}{5}$ |
| x | $14 - x = 10$ | kh | $1.2 + x = 4.3$ | d | $2\frac{1}{5} - x = 2.4$ |
- Haddii tiro lagu daro 32, tirada soo baxdaana tahay 26, Raadi tirada?

5.1.2 Ku furfurista hal (talaabo) dheeliyada toosan

Hawlgalka 5.2

- Hawraarahan soo socda ee lagu siiyey, caddee inay yihiin isle'egyo Ama dheeliyo?

| | | | | | |
|----------|------------------------------|-----------|---------------|----------|---------------------------------|
| b | $\frac{4}{5} = \frac{8}{10}$ | t | $13 < y$ | j | $\frac{5}{2} \neq \frac{-1}{2}$ |
| x | $-3 + x = 9$ | kh | $2 - y > 1.5$ | d | $y + 2\frac{1}{2} \geq 0$ |

2 Keebaa run ah dheeliyadan soo socda? Keebaase been ah?

b $9 < 7$ **t** $-4 > -6$ **j** $\frac{1}{2} < \frac{3}{4}$

x $\frac{-2}{3} > \frac{-3}{2}$ **kh** $0.12 < 0.21$ **d** $3\frac{1}{4} \leq \frac{13}{4}$

Adeegsiga habka halka jid ee furfurista isle’egyada toosan, waxaad ku furfuri kartaan halka jid ee dheeliyada toosan. Waxaad ku arki kartaa tusaalahan soo socda:

Tusaale 4: Furfur x haddii horaadka doorsoomuhu yahay ururka tirooyinka idil.

b $x - 3 = 1$ **t** $x - 3 < 1$ **j** $x - 3 > 1$

Furfuris: Si aad u furfurto masalada noocan ah ee lagu siiyay horaadka bal aynu ku bedelno doorsoomaha x tiro.

| | | | | | | | |
|---------|----|----|----|---|---|---|------|
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6... |
| $x - 3$ | -3 | -2 | -1 | 0 | 1 | 2 | 3... |

Tusahan sare, is le’egta $x - 3 = 1$ waxaa keliya oo ay run ku tahay $x = 4$ kuwa kalese waa been. Sidaa daraadeed, urur-rumeedka (b) waa $\{4\}$.

Dhanka kalana, dheeliga $x - 3 < 1$ waxaa run ka dhigaya weedha $x = 0, 1, 2, 3$ waxaana been kadhigaya weedha $x = 4, 5, 6 \dots$

Sidaa darted urur-rumeedka $x - 3 < 1$ waa tiro idil (\mathbb{W}) oo ah $\{0, 1, 2, 3\}$ iyo ururrumeedka $x - 3 > 1$ oo ah $\mathbb{W} \{5, 6, 7 \dots\}$

Jidka ama habkan lagu raadinayo urur-rumeedku waa mid iska cad. Si aynu u farfurno dheeligan oo ka dhaqso badan kana waxqabad fiican Waxa aad ku dabaqi kartaa xeerka qaabbedelka. Sida isle’egyada laba dheeli oo kastaa waxay leeyihiin ururka furfurista ee loo yaqaano dheeliyada isu dhigma. Tusaale $x-7 < 4$ iyo $x < 11$ waxay yihiin dheeliyada isudhigma habka raadinta dheeliyada isudhigma waxaa loo isticmaalaa xalinta dheeliyada toosan.

Xeerarka qaab-bedelka dheeliyada toosan

1 Ku daritaanka tiro iskumid ah labada dhinac ee dheeliga wuxuu ku siinaya dheeli isu dhigma

Tusaale ahaan: $x - 2 > 5$

Kudar 6 labada dhanba, $x - 2 + 6 > 5 + 6$ kadibna

$$x + 4 > 11$$

Ku dar 2 labada dhanba, $x - 2 + 2 > 5 + 2$

$$x > 7$$

Sidaa awgeed, $x - 2 > 5$, $x + 4 > 11$ iyo $x > 7$ dhamaantood waa dheeliyo isu dhigma.

2 Ka go tiro isku mid ah labada dhinac ee dheeliga si uu kuu siiyo dheeli isu-dhigma.

Tusaale ahaan: $x + 4 < 10$ iyo $x + 4 - 10 < 10 - 10$ iyo $x - 6 < 0$ waa dheeliyo isku dhigma. Waa maxay tirada aad ka jartay (goysay) si loo helo x oo keligeed taal dhanka bidix?

Tusaale 5: Bal furfur $x + 26 < 78$ haddii horaadka doorsoomuhu uu yahay ururka abyoooneyaasha.

Furfuris: Markii la cadeeyo dheeliga dhinaciisa bidix inuu yahay isu geyn, kolkaa waxaynu ka jaraynaa 26 labada dhanba ee dheeliga.

Taasi oo ah $x + 26 < 78$

$$x + 26 - 26 < 78 - 26$$

$$x < 52$$

Sidaa darted, ururka furfuristu waa $\{\dots -2, -1, 0, 1, 2, \dots 51\}$ Markii ay adkaato in la taxa furfurisyada dheeliga, waxaad u adeegsanaysaa habkan soo socda si loogu sharxo furfurisyada. Urur-rumeed = $\{x \in \mathbb{Z} : x < 52\}$

Tusaale 6: Ururka furfurista ee u taagan $x + 3 \leq 8$ ee xariiqda tirada, haddii uu horaadka doorsoomuhu yahay ururka tirooyinka idil.

Furfuris: $x + 3 \leq 8$

$$x + 3 - 3 \leq 8 - 3 \text{ (waayo?)}$$

$$x \leq 5$$

Sidaa darted, ururka furfuristu waa $\{0, 1, 2, 3, 4, 5\}$. U taagnaanta ee urur-rumeedka tirada xariiqda waxaynu ku muujin karnaa sidan soo socota.



Jaantuska 5.3

Laylis 5.2

- 1** Furfur midkasta oo dheeliyadan soo socda ka mid ah ee lagu siiyay horaadka doorsoomaha
- | | | | |
|----------|--|----------|--------------------------------|
| b | $y - 6 > 0.2, y \in \mathbb{W}$ | t | $-2 < x + 5, x \in \mathbb{N}$ |
| j | $x - 7 < 1\frac{1}{2}, x \in \mathbb{N}$ | x | $x \geq -2, x \in \mathbb{Z}$ |
- 2** Furfur dheeliyadan soo socda kuna tilmaan furfuristooda xariiqda tirada hadii ay suuro gal tahay.
- | | | | |
|----------|--|----------|---|
| b | $\frac{1}{2} + y \leq 0.5, y \in \mathbb{W}$ | t | $x + 2 > 0, x \in \mathbb{N}$ |
| j | $-5 < \frac{1}{2} + x, x \in \mathbb{Z}$ | x | $4 - x > \frac{1}{2}, x \in \mathbb{W}$ |
- 3** Caddee haddii ay mid kasta oo ka mid ah dheeliyadu ay leeyihiin furfures ama ayna lahayn horaadka lagu siiyay.
- | | | | |
|----------|------------------------------------|----------|--|
| b | $x - 6 \leq -10, x \in \mathbb{W}$ | t | $x + \frac{1}{2} > 3\frac{1}{2}, x \in \mathbb{N}$ |
| j | $3 - x < 4.5, x \in \mathbb{N}$ | x | $-4 - x \geq 3, x \in \mathbb{W}$ |
- 4** Furfur x haddii uu horaadku yahay
- | | | | |
|----------|--------------------------|-----------|--------------------------|
| i | $\{-5, -3, 0, 2, 4, 6\}$ | ii | ururka tirooyinka idil |
| b | $x + 8 < 12$ | t | $x + 0.2 < 5$ |
| j | $2 - x \geq 4$ | x | $x + \frac{1}{2} \geq 0$ |

5.2 DHIDIBADA

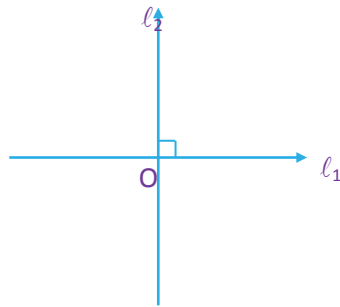
Casharkani waxaad ku baran doontaan habka ama nidaamka dhidibada. Waxaa kale oo aad ku arki doontaan sida ay u metalaan bar ay u taagan yihiin oo dhidibadooda ah iyo sida loo sameeyo habka dhidibada.

Hawl-galka 5.3

- b** Buugiina cashar qorista ku sawira laba xariiq oo midna jiifo midna qoton yahay.
- t** Imisa barrood (meelood) ayay iska jareen xariiqahaani?
- j** Waa imisa cabirka xagasha u dhexaysa?
- x** Imisa qaybood ama gobol ayay xariiqahani u kala qaybiyeen buugiina qorista

Shaqadiina hawlgalkani waxay idiin horseedi (hogaamin) kartaa xaqiiqada soo socota.

Ka soo qaad ℓ_1 iyo ℓ_2 inay yihiin laba xariiqood oo toosan oo iska jara barta “o”



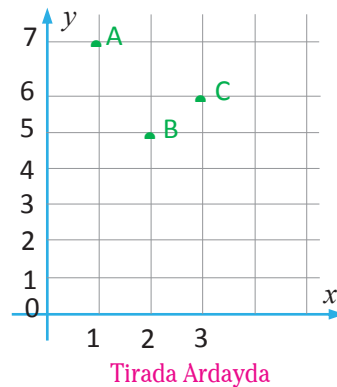
Jaantuska 5.4

- ◆ Xariiqda toosan ee jiifta (ℓ_1) ayaa loo yaqaanaa dhidibka x .
- ◆ Xariiqda qummaatiga (taagan) (ℓ_2) ayaa loo yaqaanaa dhidibka y
- ◆ Barta is goyska (ay iska jaraan) labada dhidib ee “O” ayaa loo yaqaanaa Bar kulan.

Dhidibka x iyo dhidibka y waxaa loogu yeedhaa ama loo yaqaanaa dhidibada kaartis. Markii xagasha u dhaxaysa dhidibka x iyo dhidibka y ay tahay 90° , Kolkaa dhidibadan waxaa loo yaqaanaa dhidibada laydiyeed. Marka ay ka bilaabaan bar kulankooda toganaha “ x ” waxay tagtaa dhanka midig halka toganaha y ay kor u kacdo. Dhidibada kaartis oo ay la jiraan ama ay weheliyaan baraha salaxa dhexdiisa (Waad ka fakari kartaan sallax markii warqad cayiman oo ayna dhererkeedu xad lahayn) ayaa loo yaqaanaa habka ama hanaanka (nidaamka) dhidibada.

Hawlgalka 5.4

Saddex arday oo kala sita loona tixgeliyay tirooyinka 1, 2, 3. Mid kasta da’diisa waxaa lagu sharxay jaantuska soo socda; Meesha tirada arday kasta lagu siiyay dhidibka x , da’doodana lagu muujiyay dhidibka y .



Jaantuska 5.5

Hubi halka ay dhibic ama bar kastaa ku taallo, kadibna raadi da’da arday kasta

Hawlgalkan sare, waxaad ku soo aragteen in barta ay dhacdo (kutaal) A laga helay halbeeg 1 oo midig ka xiga barta “O” iyo halbeeg 7 oo xaga sare ah. Helitaankan waxaa lagu sharxi karaa, laguna soo gaabiyaa lamaanahan (1,7). U adeegso nidaamka calaamadaha tani oo gaaban waxaad qori kartaa inay B tahay (2,5) oo Macnaheedu yahay 2 halbeeg oo barta “O” midig looga dhaqaaqay iyo 5 sare looga kacay. Ma qori kartaa halka ay dhacdo ama laga helo “C”?

Mar horeba waxaad ogaateen in aynu u baahanahay laba tiro si aynu ugu sharaxno halka bar ay dhacdo ama kaga taallo sallaxa. Labadan tiro waxaa la helaa markii la qabanayo hawlbarata labada xariiqoodee toosan oo mid kastaaba ah dhidibada kaartis

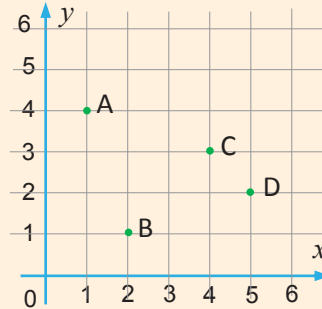
Barta “P” ee lagu siiyay haddii qiyaastoodu tahay dhidibka x waxay ku siinaysaa tirada “ a ” (kaas oo ah fogaanteeda gudban (jiifta) ee marka laga yimaado dhidibka y) iyo qiyaastooda ujeeda dhanka dhidibka y oo ku siinaya tirada “ b ” (kaas oo ah fogaantoodia qumaatiga ah ama taagan. Oo ah marka laga yimaado dhidibka x) kolkaa “P” waxaa lagu sharxaa laba fogaamood (Masaafu) oo ay si wada jira u qaatee laguna xiro qaws. Kani waxaa loo qori karaa sidan P (a , b). Lammaanaha horsan ee (a , b) waxaa loo yaqaanaa dhidibada barta “P” xaaladan “ a ” waxaa loo yaqaanaa dhidibka x , barta “ b ” oo loo yaqaano dhidibka y

Lamaanaha (a , b) waxaa loogu yeedhaa lammaane horsan maxaa yeelay sida habaysan ee loo qoray. Markasta x -ayaa horeyasa, y -na wey dambaysaa.

Xusuus: Guud ahaan lammaane horsan (a, b) \neq (b, a) haddii $a = b$ mooyee

Calaamadee: Hadii barta "P" ay leedahay dhidibada (a, b) u qor barta (a, b) sidai $P(a, b)$ ay tahay.

Tusaale 1: Dhidibada sallax ee soo socda, qor dhidibada lagugu siiyay baraha.



Jaantuska 5.6

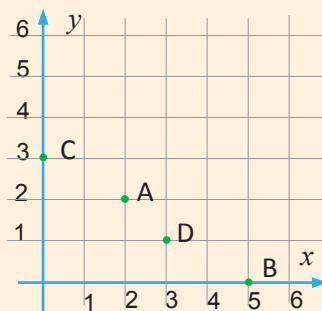
Furfuris: Si aad u akhrido baraha dhidibada ee sallaxa, marka hore sawir xariiqaha ka dhexdusa labada dhidib ee x iyo y ee baraha la doonayo in la akhriyo, mar labaad raadi halka ay iska goyaan, Akhri baraha ku yaala halka ay ka goyaan dhidibada x iyo y .

Marka sadexaad qor lammaaneyaasha hoorsan ee qaabka qoraalka uu horeeyo dhidibka $-x$. Sidaa darted dhidibada baraha lagu siiyay waa $A(1, 4)$, $B(2, 1)$, $C(4, 3)$, $D(5, 2)$ iyo $O(0, 0)$

Tusaale 2: Sawir baraha soo socda ee dhidibada kaartis.

b $A(2, 2)$ **t** $B(5, 0)$ **j** $C(0, 3)$ **x** $D(3, 1)$

Furfuris: Baruhu waxay ku tusinayaan dhidibada kaartis

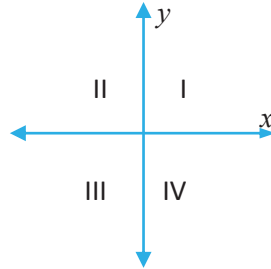


Jaantuska 5.7

Labada dhidib ee dhidibada kaartis waxaa loo qaybiyaa Afar gobol oo loo yaqaano waaxo.

Waxayna kala yihiin tiro ahaan sidan: Waaxda I, II, III, IV ee hoos ku xusan.

Tiradu waxay u socotaa lidka – saacada waxayna ka bilaabantaa waaxda midigee sare (waqooyi – bari).



Jaantuska: 5.8

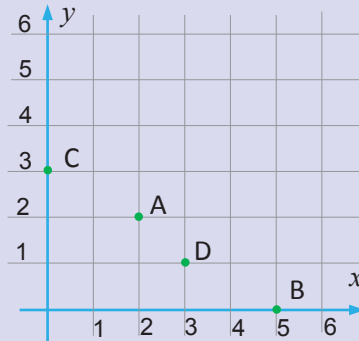
Fasalkan, waxaynu tixgelinta siinaynaa oo keliya waaxda ugu horaysa (I). U fiirsada markii ay bar ku taallo waaxda ugu horaysa (I) kadibna ay dhidibka x iyo dhidibka $-y$ labadooduba togan yihiin. Tusaale, $(2, 1)$, $(3, 5)$, $(4, 2)$ oo ah waaxda I. Xusuusnow sidoo kale in tiro kasta oo x iyo y ahi yihiin lammaane horsan.

- ◆ $(x, 0)$ oo ku yaal dhidibka x dushiisa
- ◆ $(0, y)$ oo ku yaal dhidibka y dushiisa

Tusaale: $(7, 0)$ waxuu ku yaallaa dhidibka x dushiisa $(0, 6)$ na wuxuu ku yaalla dhidibka y dushiisa

Laylis 5.3

- 1 Maxay yihiin kulamada barta xuduntu?
- 2 Waa maxay barta dhacda dhidibka y ?
- 3 Waa maxay barta dhacda ama ku dul taala dhidibka x ?
- 4 Tilmaan dhidibada ay ka kooban yihiin barahan soo socda: A $(0, 0)$, B $(0, 3)$, C $(1, 0)$?
- 5 Ku muuji kulamadan, kulamada sallaxa ee kaartis:
A $(1, 1)$, B $(4, 1)$, C $(0, 9)$, D $(9, 0)$, E $\left(2, \frac{1}{2}\right)$
- 6 Go'aanso dhidibada barahan soo socda ee ka soo jeeda dhidibada kaartis



Jaantuska 5.9

5.3 SAAMIGALKA

Casharkan, waxaad ku baran doontaan fikrada saamigalka, waxaad ku arki doontaan farqiga u dhexeeya saamigal – qumman iyo saamigal – rogaal ama saami – weydaar. Waxaa kale oo lagu falanqayn doonaa garaafka u taagan ama matalaya saami galqumman iyo saamigal – rogaal.

Hawlgalka 5.5

Tirooyinkan hoos ku xusan ee is – xig – xiga ee lagu siiyay

a

| | | | | | | |
|----------|---|---|---|----|----|----|
| x | 3 | 6 | 9 | 12 | 15 | 18 |
| y | 1 | 2 | 3 | 4 | 5 | 6 |

b

| | | | | | |
|----------|-----|-----|-----|----|----|
| x | 0.1 | 0.8 | 1.2 | 4 | 9 |
| y | 0.5 | 4 | 6 | 20 | 45 |

- 1 U qaybi qiimo kasta oo “x” ah kuwa la xiriira ee qiimaha y, miyaad heshay qiimo joogto ah mid kasta?
- 2 U qaybi qiimo kasta oo ah “y” kuwa la xiriira ee qiimaha x, waa maxay xiriirka aad heshay?
- 3 Markii “x” ay korodho maxaa kudhacaya qiimaha y?
- 4 Markii qiimaha x hoos u dhaco, maxaa ku dhacaya qiimaha y?

Hadii ay qiimayaasha labada tiro ay ku xiran tahay midba midka kale, isida marka uu cadadka isbada lo midkood ay kalifto kan kale laxidhiidhana isbadalo, Markaa labada tiro waxa lagu sheegaa inay yihiin saamigal.

Tusaale ahaan:

- I Marii qimaha aad ku soo gadatay qalabka uu kordho qiimahooduna wuu kordhaa.
- II Markii tirada raga qabanaya shaqo lasiiyay ay korodho, xiliga looqabtay in ay ku dhamaato islashaqadaa way naaqusaysaa ama yaraanaysaa.

Sidaa awgeed labada tiro waxaa laga yaabaa inuu midba midka kale xiriir ka dhexeeyo

Labadan hab:

- I Labadoodaba waxaa kordhay tiradii ama hoos u dhacay si wada jir ah
- II Hal tiro oo korodhay, kuwa kalena hoos u dhaceen. Lidkeeduna waa la mid

5.3.1 Saamigal – quman

Ka soo qaad in dukaan ku iibiyo qalin qoriga xabadiiba 50 senti. Tusahan soo socda wuxuu ku tusinayaa tirada qalin qoriga (x) iyo qiimayaashooda (sicirkooda oo la xiriira (y))

| | | | | | | |
|-----|----|-----|-----|-----|-----|-----|
| x | 1 | 2 | 3 | 4 | 5 | 6 |
| y | 50 | 100 | 150 | 200 | 250 | 300 |

Maxaad ku hubin?

Waxaad ku hubin kuwan soo socda ee ka soo jeeda tusahan sare ku xusan:

- I Qiimayaasha y iyo x way kordhayaan ama hoos bay u dhacayaan si wadajir ah
- II Saamiga $\frac{y}{x}$ ee qiimayaalka kala duwan ee y iyo qiimayaalka la xiriira ee x isma badalaan.

$$\text{Tusaale: } \frac{y}{x} = \frac{50}{1} = \frac{100}{2} = \frac{150}{3} = \frac{200}{4} = \frac{250}{5} = \frac{300}{6} = 50$$

Markii laba tiro oo uu midba midka kale ku xiran yahay, habka noocaas ah markii uu midi kordho kuwa kalena way kordhaan ama markii midi hoos u dhaco kuwa kalana hoos bay u dhacayaan, waxaana lagu sheegaa inay yihiin saamigal – qumman.

Qeexid 5.2: Tirada y waa mid saamigal quman ku ah tirada x , waxaa loo qoraa $y \sim x$, haddii uu jiro mid aan ahayn eber oo ah "k" oo noqonaya sidan $y = kx$. "k" waa joogto waxaana madoorsoomaha saamigalnimada "k".

Tusaale 1: Haddii aad samaysid 4 lebis oo 16m dhererkoodu yahay, imisa dherer oo maro ah ayaad u baahan tahay 6 lebis?

Furfuris: Tirada marada latolay = 4

Dhererka = 16m

U qaado marada aadu baahan tahay = x m

Tirada aad kutolan lahayd x m = 6

| | | |
|------------------------|----|-----|
| Tirada dirayska | 4 | 6 |
| Dhererka marada | 16 | x |

Marka dhererka dharka iyo tirada dharka tolan ay yihiin saamigal qumman waxaad haysataan.

$$\frac{16}{4} = \frac{x}{6}$$

$$4x = 16 \times 6$$

$$x = \frac{16 \times 6}{4} = 24$$

Sidaa darted 24m oo maro (dhar) ah ayaa looga baahan yahay in lagu sameeyo 6 dhar oo tolan (dirays).

Habka kale ee bedelkiisa noqon kara:

Tirada dharka tolan = 4

Dhererka dharka = 16m

Dhererka dharka loo baahan yahay = x m

Markii ay tirada dharka tolan iyo dhererka dharku ay saami gal qumman isku yihiin isirka saamigalnimo waa:

$$k = \frac{\text{dhererka dharka}}{\text{Tirada dharka tolan}} = \frac{16}{4} = 4$$

$$\frac{x}{6} = 4$$

$$x = 24$$

Sidaa darted dhererka dharka ee lagu samaynayo 6 Lebis waa 24m

Xusuus: Marka x iyo y isku yihiin saamigal qumman, kolkaa labaduba si wada jir ah ayaay u kordhayaan ama hoos ugu dhacayaan. Tani waxay ina tustay isbarbardhiga laba saami oo si isku mida u habaysan. Sidaa darted, hadii ay y saamigal qumman ku tahay x kolkaa:

$$\frac{y_1}{x_1} = \frac{y_2}{x_2} \text{ ama } \frac{x_1}{y_1} = \frac{x_2}{y_2}$$

Tusaale 2: Raadi waxa ka maqan ee la gelinayo tusahan soo socda ee lagu siiyay inay x iyo y yihiin saamigal qumman

| | | | |
|-----|-------|-------|-----|
| x | x_1 | 9 | 15 |
| y | 3 | y_1 | 7.5 |

Furfuris: Markii x iyo y ay isu yihiin saamigal qumman waxaad u adeegsan

$$\text{kartaan xiriirka } \frac{x_1}{y_1} = \frac{x_2}{y_2}$$

$$\text{Sidaa awgeed } \frac{15}{7.5} = \frac{9}{y_1} \text{ iyo } \frac{15}{7.5} = \frac{x_1}{3}$$

$$15 \times y_1 = 7.5 \times 9$$

$$y_1 = \frac{7.5 \times 9}{15}$$

$$y_1 = 4.5$$

$$7.5 \times x_1 = 15 \times 3$$

$$x_1 = \frac{15 \times 3}{7.5}$$

$$x_1 = 6$$

Koox-hawleedka 5.2

Tixgeliya tusahan soo socda idinka oo koox – koox ah kana jawaaba su'aala han soo socda.

| | | | | | |
|-----|---|---|---|----|----|
| x | 1 | 2 | 3 | 4 | 5 |
| y | 3 | 6 | 9 | 12 | 15 |

- b** y ma saamigal qumman bay ku tahay x ?
- t** Haddii y iyo x ay yihiin saamiyo, qor xiriirkooda qaabka $y = kx$
- j** Dhis lammaane kaste oo horsan (x, y) dhidibada sallaxa dushiisa.
- x** Isku xidh baraha?
- kh** Waa maxay nooca garaafka ee aad heshay?
- d** Dhidibada $(0, 0)$ miyay leeyihiin saamigal?

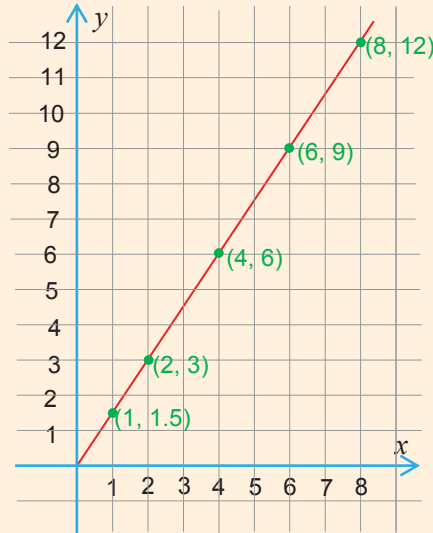
Tusaale 3: Bal aynu mudnaanta siino tusooyinkan is xig-xiga

| | | | | | |
|-----|-----|---|---|---|----|
| x | 1 | 2 | 4 | 6 | 8 |
| y | 1.5 | 3 | 6 | 9 | 12 |

Tusahan, waxaad ku arki kartaa in markii x korodho y sidoo kale korodhayso iyo saamigalkooda joogtada ah ee $\frac{3}{2}$. Sidaa darted y waxay saamigal qumman ku tahay

x tusaale: $y = \frac{3}{2}x$. Markii aynu dhisno baraha saamiigalka ah ee dhidibada sallaxa

dushiisa, bar kasta waxay dhacdaa xariiqa $y = \frac{3}{2}x$.



Jaantuska 5.10

Laga soo bilaabo koox-hawleedkii aad ka soo shaqayseen iyo tusaalihii 3^{aad} waxaad hubisaan (u kuur gashaan) kuwan soo socda

- Haddii y ay saamigal qumman ku tahay x , kolkaa garaafka $y = kx$ oo ah xariiq toos ah oo dhex maraya bar kulanka.
- Haddii garaafku yahay xariiq toos ah oo dhexmaraya barkulanka tusaale: $y = kx$ ($k > 0$), kolkaa y waxaa ay saamigal qumman u tahay x .

Laylis 5.4

- 1 Tusayaasha soo socda tilmaan ka x iyo y saamigalka qumman u ah

b

| | | | | | | |
|-----|---|---|---|---|----|----|
| x | 2 | 4 | 6 | 8 | 10 | 11 |
| y | 3 | 5 | 7 | 9 | 11 | 13 |

t

| | | | | | |
|-----|---------------|---------------|---------------|---------------|----------------|
| x | $\frac{3}{2}$ | $\frac{5}{2}$ | $\frac{7}{2}$ | $\frac{9}{2}$ | $\frac{11}{2}$ |
| y | 3 | 5 | 7 | 9 | 11 |

j

| | | | | |
|-----|-----|-----|-----|-----|
| x | 1.5 | 2.5 | 3.8 | 4.3 |
| y | 15 | 25 | 38 | 43 |

x

| | | | | | |
|-----|----|----|----|----|----|
| x | 22 | 33 | 66 | 77 | 99 |
| y | 2 | 3 | 6 | 7 | 9 |

- 2 Ka sooqaad in tirooyinkan is xigxiga ee soo socda ay yihiin saamigal quman raadi qiimayaasha maqan.

b

| | | | | | |
|---|---|---|---|---|---|
| x | 2 | | 4 | | |
| y | 2 | 3 | | 5 | 8 |

t

| | | | | | | |
|---|---|---|---|---|----|----|
| x | | | 6 | 8 | 9 | |
| y | 5 | 7 | | | 36 | 48 |

j

| | | | | | |
|---|-----|-----|----|----|---|
| x | 3.4 | 4.6 | | | 9 |
| y | 17 | | 28 | 36 | |

x

| | | | | | |
|---|---|----|----|----|-----|
| x | 5 | | 11 | 18 | 48 |
| y | | 35 | | | 240 |

- 3 Ka soo qaad inay x iyo y yihiin saamigal qumman. Markii x ay tahay 8, $y = 12$, keebaa kuwan suurogal ku ahayn qiimayaasha la xiriira lammaanaha x iyo y?

b 10 iyo 15

t 2 iyo 3

j 6 iyo 9

x 15 iyo 20

- 4 Bed dhan $22m^2$, xaddiga bacrimiye ama carro nafaqeeeye loo baahan yahayna waa 682 gm.

b Imisa bacrimiye ayaa looga baahan yahay in lagu nafaqeeyo bad dhan $13m^2$?

t Muxuu noqon doonaa bedka lagu bacrimiyo bacrin dhan 248gm?

- 5 Isirka saamigalka ee lagu siiyay, raadi tirooyinka is xig xiga ee aan la aqoon

i $k = 1.5$ ii $k = 3$

b

| | | | | |
|---|---|---|---|----|
| x | 5 | 8 | 9 | 13 |
| y | | | | |

t

| | | | | |
|---|---|----|----|----|
| x | | | | |
| y | 3 | 12 | 24 | 45 |

- 6 Tusahan hoos ku xusan waxay ku tusayaan sixirka ama qiimaha lebiska dugsiga (Q) Birr iyo dhererka (Dh) inta mitir ee dhar ah ee la isticmaalay.

| | | | | | |
|----|----|----|-----|-----|-----|
| Q | 3 | 4 | 5 | 6 | 7 |
| Dh | 60 | 80 | 100 | 120 | 140 |

b Waa maxay isirka saamigalku?

t Imisuu noqon doonaa $4\frac{1}{2}$ m oo ka mida qiimaha dharku?

j Raadi qaaciidada la xiriirta sixirka ama qiimaha dhererka dharka?

x Dhis baraha sare kana sawir xariiq ka dhex dusta (dhexmarta) iyaga?

5.3.2 Saamigal-rogaal (Saami - weydaar)

Hawlgalka 5.6

- 1 Ka dhig $y = \frac{24}{x}$
- b** Raadi x markii $y = 3$ **t** Raadi y markii $x = 12$
- 2 Idinka oo ahmiyada siinaya tusahan soo socda ka jawaab su'aalaha hoose.

| | | | | | |
|-----|----|----|---|---|----|
| x | 1 | 2 | 4 | 8 | 16 |
| y | 32 | 16 | 8 | 4 | 2 |

- b** Marka ay x korodho maxaa ku dhacaya y ?
- t** U qaybi qiime kasta oo y ah qiimaha la xiriira ee x . Miyaad hesheen qiime joogto ah talaabo kasta?
- j** Ku dhufo qiimayaasha la xiriira x iyo y . Ma natiijo isku mid ah ayaad hesheen mid kasta?

Marka ay laba tiro ay yihiin kuwo xiriir leh, habka noocaas ah ugu horaynba waxay noqonaysaa natiijadoodu mid korodha marka labaadna hoos u dhacdo, haddii ay natiijadu hoos u dhacdo ugu horaynba mar labaadkay kordhaysoo kolkaa labadaas tiro waxaynu dhihi karnaa waa saamigal – rogaal ama saami – weydaar.

Qeexid 5.3: Xiriirka u dhaxeeya labada doorsoome ee x iyo y waa saami – rogaal,

$\left(y \sim \frac{1}{x}\right)$, haddii uu jiro isirka (k) Aan isbedelayn oo aan ahayn eber isla

markaana $xy = k$ ama $y = \frac{k}{x}$ "k" da joogtada ah ayaa loo Yaqaanaa isirka

saamigalka

Tusaale 4: Ahmiyada siiya tirooyinkan is xig xiga ee soo socda.

| | | | | | | |
|-----|---|---|---|----|---------------|---------------|
| x | 2 | 4 | 8 | 16 | 32 | 64 |
| y | 8 | 4 | 2 | 1 | $\frac{1}{2}$ | $\frac{1}{4}$ |

Sida aad tusahan ku aragtaan qiimaha doorsoomaha x waa mid kordhaya meesha uu qiimaha doorsoomaha y uu hoos u dhacayo hadii aad u qaybisid doorsoomaha y doorsoomaha x (ama lidka bedelkiisa) Ma heli doontid qiime joogto ah.

Taasi oo ah $\frac{8}{2} \neq \frac{4}{4} \neq \frac{2}{8} \neq \frac{1}{16} \neq \frac{1}{32} \neq \frac{1}{64}$

Dhanka kale x iyo y marka la isku dhufto ayay wax isku mid ah soo saarayaan. Taasi oo ah

$$xy = 2 \times 8 = 4 \times 4 = 8 \times 2 = 16 \times 1 = 32 \times \frac{1}{2} = 64 \times \frac{1}{4} = 16. \text{ Sidaa, darged } x \text{ iyo } y \text{ waa saamiwaydaar isirka saamigalkooduna waa } 16$$

Tusaale 5: Abaalgud 2400 Birr oo aysi isle'eg u wadaageen guulaystayaasha x ciyaar ay ka qayb galeen Bal aynu u qaadano y guulayste kasta qaybtiisii ku soo hagaagtay Mida utagaan.

- b** Raadi qaaciidada xidhiidhisa x iyo y
- t** Haddii 24 qof ay cayaarta ku guulaysteen waa maxay qaybwadaaga mid kasta?
- j** Haddii guuleyste kastaa ay ku soo hagaagtay 120 Birr waa imisa dadka ku guulaystay cayaartu?

Furfuris: Sida muuqata hadii guulayste kasta inta ku soo hagaagtay ay kordhayso, kolkaa tirada dadka ee ciyaarta ku guulaystay hoos bay u dhacaysaa.

$$\text{Sidaa darged } x \text{ iyo } y \text{ waa saami – rogaal tusaale: } y = \frac{k}{x}, \text{ Meesha } k =$$

2400 (Waayo)?

$$\text{Sidaa darged } y = \frac{2400}{x}$$

$$\text{Markii } x = 24, \text{ kolkaa } y = \frac{2400}{24} = 100 \text{ sidaa darged, } 24 \text{ ka}$$

guulaystayaasha ah waxaa ku soo hagaagaya midkiiba 100.

$$\text{Markii } y = 120 \text{ oo } y = \frac{2400}{x}$$

$$\text{kolkaa } 120 = \frac{2400}{x}$$

$$x = \frac{2400}{120} \Rightarrow x = 20$$

Sidaa darged 20 ka qof ee guulaystay cayaartu midkiiba wuxuu helayaa 120 Birr.

Xusuus: Haddii x_1, x_2 ay yihiin laba qiimo oo ka duwan x , iyo y_1, y_2 ay yihiin qiimayaal ku xiran y , kolkaa $x_1 y_1 = x_2 y_2$ Markaa x iyo y waa saamigal-rogaal

Hawlgalka 5.7

Adiga oo ka tixraacaya tusahan soo socda ka jawaab su'aalaha hoose

| | | | | | |
|-----|---|---|-----|----|----|
| x | 4 | 3 | 5 | 2 | 24 |
| y | 6 | 8 | 4.8 | 12 | 1 |

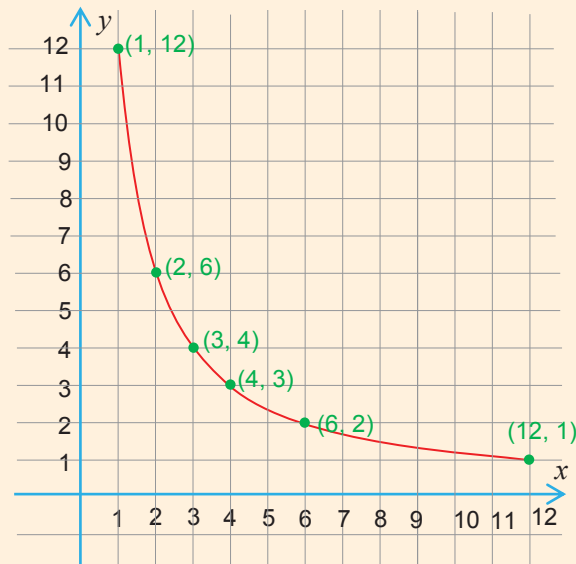
- b** x iyo y ma saamigal bay isu yihiin?
- t** Dhis baraha dhidibada xy dushooda
- j** Isugu qabo baraha si siman oo leexad ah
- x** Isbarbardhig garaafkaaga iyo garaaf kasta oo saamigalqumman. Waa maxay farqiga aad heshay?

Hawlgalkii aad ka shaqayseen, waxaad u kuurgasheen in garaafka saami-rogaalku uunan ahayn xariiq toosan oo dhex marta barta asalka (barkulanka).

Tusaale 6: Sawir garaafka saami – rogaalkan soo socda.

| | | | | | | |
|-----|----|---|---|---|---|----|
| x | 1 | 2 | 3 | 4 | 6 | 12 |
| y | 12 | 6 | 4 | 3 | 2 | 1 |

Furfuris: Ugu horayn calaamadee baraha ku yaalla dhidibada xy , kolkaa isugu xidh xariiq xoodan.



Jaantuska 5.11

Barta (0, 0) miyay leedahay saamigal?

Laylis 5.5

- 1 Ka soo qaad in y tahay Rogaalka x . u qaado in marka $y = 40$, kolkaa $x = 5$
- b** Qor qaaciidada isku xidha x iyo y .
- t** Adeegso qaaciidadan si loo helo x markii $y = 100$
- j** Adeegso qaaciidadan si loo helo y markii $x = 20$
- 2 Kuwan soo socda keebaa saami-rogaal ah
- b** Dhererka iyo balaca laydi bedkiisu yahay $20m^2$
- t** Wakhtiga ama aminta ay ku qaadatay Bas si uu u daboolo fogaan uu sameeyay iyo xawaaraha Baska
- j** Xisaabta lacageed ee keyadka ah inta Birr ee tiilay Bangiga iyo dulsaarkii la xidhiidhay ee lahayd saamiga dulsaar ee joogtada ah.
- 3 Keebaa tuseyaashan soo socda u taagan saami-rogaal.
- b**
- | | | | | |
|-----|-----|---|-----|---|
| x | 3 | 4 | 5 | 6 |
| y | 4.5 | 6 | 7.5 | 9 |
- t**
- | | | | | | |
|-----|----|----|---|----|----|
| x | 5 | 7 | 9 | 11 | 13 |
| y | 14 | 10 | 8 | 7 | 16 |
- j**
- | | | | | | |
|-----|-----|---|---|----|----|
| x | 1 | 2 | 3 | 8 | 11 |
| y | 0.5 | 4 | 6 | 16 | 22 |
- x**
- | | | | | | |
|-----|----|----|---|---|----|
| x | 1 | 2 | 4 | 5 | 10 |
| y | 20 | 10 | 5 | 4 | 2 |
- 4 Haddii x iyo y saami rogaalkoodu kala duwan yahay ku badal a , b iyo c daba tirooyinka ku haboon adoo adeegsanaya tusahan soo socda.
- i**
- | | | | | |
|-----|----|-----|-----|-----|
| x | 36 | 72 | b | c |
| y | 48 | a | 16 | 12 |
- ii**
- | | | | | |
|-----|-----|------|-----|-----|
| x | 19 | b | 6 | 1.5 |
| y | a | 4.75 | c | 38 |

Hubin

| | | |
|--|---|---|
| <ul style="list-style-type: none"> → Barta Absiisaha → Dhidibbada (laydiyeed) kaartis → Barta Dhidibbada → Saamigal qumman → Horaadka doorsoome → Isle’eg → Isle’egyo isudhigma | <ul style="list-style-type: none"> → isirka saamirogal → Dheelli → Saamigalnimo → Isle’eg toosan → Dhidibka –“y” → Dhidibka –“x” → Doorsoome | <ul style="list-style-type: none"> → Furfurista isle’eg → Urur furfuris → Waax → Sallax → Unug → Barta Oordineydka → Lammaane horsan → Dheelli toosan |
|--|---|---|



Soo Koobida Cutubka

- 1 Isle'egyada leh ururka furfurista isku midka ah ee isku midka ay ka yihiin horaadka doorsoomaha ayaa loo yaqaanaa isle'eygo isku dhigma.
- 2 Qiimayaasha urur ee lagu badalay doorsoomaha islamarkaana macno u yeelaya jumlada ayaa waxaa ladhahaa horaadka doorsoomaha.
- 3 Furfurista Isleegtoosan, waxaa loo adeegsadaa xeerar kan soo socda:
 - b** Tiro isku mid ah oo lagaga daro lababda dhinac ee isle'egta.
 - t** Tiro isku mid ah oo lagaga jaro labada dhinac ee isleegta.
- 4 Xeerarkan soo socda waxaa loo adeegsadaa dheeliyada toosan ee tirooyin kasta oo lagu siiyay a , b iyo c .
 - b** Haddii $a < b$, kolkaa $a + c < b + c$.
 - t** Haddii $a > b$, kolkaa $a + c > b + c$.
- 5 Laba dheeli oo kasta oo leh furfuris isku mid ah ayaa loo yaqaanaa dheeliyada isu-dhigma.
- 6 Ururka furfurista ee dheeli wuxuu noqon karaa mid xadaysan ama midaan xadaysnayn.
- 7 Absisa waa barta fogaanta (fogaanta qotonka) ee dhidibka- y .
- 8 Tikraarku waa fogaanta labada xariiq ee tosan ee barta laga bilaabo dliidibka $-x$.
- 9 Bar kasta oo absisa ah kuna taala dhidibka $-y$ waa ebar.
- 10 Bar kasta oo ordhineed ah kuna taala dhidibka $-y$ waa ebar.
- 11 Barkulanka unugga waxay tahay $(0, 0)$
- 12 Dhidibka $-x$ waa dhidibka gudban (jiifa)
- 13 Dhidiibka $-y$ waa dhidibka taagan (qotoma).
- 14 Waaxda I waxaa lagu tilmaamaa ddiidibka $-x$ ee togan iyo dhidibka $-y$ ee togan.
- 15 y waa saamigalka x ama y waxay saamigal – qumman u tahay x taas oo macnaheedu ay tahay in y ay la mid tahay natiijada taranta x iyo ma doorsoomaha saamigalka.
- 16 Saamigalka qumman ee laba tiro wuxuu ku kordhaa wakhti go'an
- 17 Haddii y ay si saamigal qumman ah ku tahay x , kolkaa

$$\frac{y_1}{x_1} = \frac{y_2}{x_2} \text{ ama } \frac{x_1}{y_1} = \frac{x_2}{y_2}$$

- 18** y waxay saami -rogaal ku tahay x taasoo looga jeedo y waxay la mid tahay natiijada wax is weydaarsiga ee x iyo madoorsoomaha. Taasi oo ah $y = \frac{k}{x}$ ama $xy = k$, saamigalnimada madoorsoo maha k .
- 19** Saami – rogaalka labatiro waa mid aan kordhin ama hoos udhicin amin go'an, laakiin markii hal tiro korodho, tirada kalana hoosbay u dhacdaa
- 20** Haddii saamigal-rogaal ay y ku tahay x , kolkaa $\frac{y_1}{y_2} = \frac{x_2}{x_1}$ ama $\frac{y_2}{y_1} = \frac{x_1}{x_2}$

Layliga Guud ee Cutubka 5^{aad}

- 1** Furfur doorsoomaha hadii horaadku uu yahay ururka abyoonyaasha.
- b** $y + 105 = 95$ **t** $12 + x = 31.2$ **j** $\frac{4}{3} - x = \frac{2}{3}$
- x** $-x + 4.27 = 13.13$ **kh** $\frac{14}{5} + y = 2.8$ **d** $-1\frac{1}{2} - y = -3\frac{1}{2}$
- 2** Furfur doorsoomaha, haddii uu doorsoomuhu yahay ururka tirooyinka lakab.
- b** $x - 1 = \frac{1}{2}$ **t** $y + 0.13 = 2.23$
- j** $y + 1.13 = 5.63$ **x** $-x + \frac{3}{4} = \frac{-5}{4}$
- 3** Isleegyadan lagu siiyay, isku day inaad tilmaantid kuwa isu dhigma. Sidee baad u qaab – beedeli lahayd isleeg lagu siiyay qaabisu -dhigan ah?
- b** $x = 7, x - 7 = 1, x + 6 = 13$ **t** $2 - x = 1, x = -1, x - 1 = 0$
- j** $x + 9 = 3, x - 8 = -2, x = 6$
- 4** Haddii x ay ka duwantahay qumaatiga (tooska) y islamarkaana haddii $x = 8$ goorta $y = 5$, raadi madoorsoomaha saamigalka?
- 5** Buuxi meelaha bannaanee tusaha soo socda.
- | | | | | | |
|----------|----|----|----|----|----|
| x | 10 | 25 | 35 | | |
| y | 14 | | | 21 | 63 |
- b** Markii x iyo y yihiin saamigal qumman
- | | | | | | |
|----------|----|---|----|----|-----|
| x | 6 | | 15 | 16 | |
| y | 16 | 8 | | | 128 |
- t** Markii x iyo y ay yihiin saami rogaal
- 6** Haddii 2kg oo muus ah sicirkiisuna yahay 12 Birr.
- b** Waa imisa sicirka muuska ee 5kg?

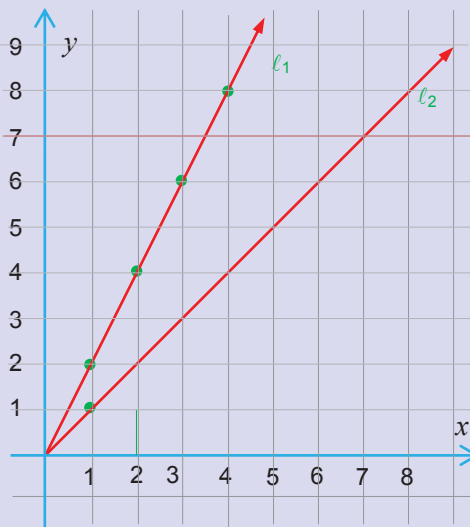
t Imisa kg oo muus ah ayay goysaa 36 Birr?

j Raadi isurka saamigalka

7 Jaantuska hoose ee soosocda xariiqaha l_1 iyo l_2 waxay ku tusinayaan tirooyinka is xig xiga oo kala duwan.

b Tax ugu yaraan 3 barood xariiq kasta

t Talaabo kasta raadi isurka saamigalka



Jaantuska 5.12

8 Sawir garafka mid kasta saamyadan soo socda

a $xy = 12$

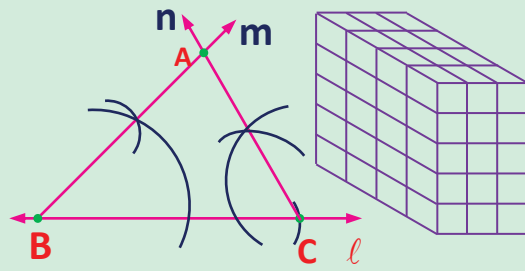
b $y = \frac{20}{x}$

c $\frac{y}{x} = 4$

d $x = \frac{16}{y}$

e $\frac{x}{y} = 1$

CUTUBKA 6aad



JOOMETARIGA IYO CABBIRAADA

Maxsuulka Cutubka:

Cutubkan dabadii, ardaydu waxay awoodi doontaa;

- *Soocidda xaglaha*
- *cadaynta saddex-xagalada isku sargo'an*
- *dhisidda saddexallada*

Tusmooyinka ugu muhiimsan:

6.1 Xaglaha

6.2 Dhisidda saddex -xagallada

6.3 Saddex -xagallada isku sargo'an

6.4 Cabbiraada

Hubin

Soo koobidda cutubka

Layliska nakhtiinka

HORDHAC

Cutubkan waxaynu ku naqtiimi doonaa waxyaabihii aad ku soo barateen fasalka 5^{aad} ee ku saabsanaa xaglaha, qeexida xaglaha lammaanayaasha iyo barashada qaar ka mid ah erey bixinada aasaasiga ah ee la xiriira xariiqaha barbarada ah iyo xaglaha ay sameeyeen markii ay isaga gudbeen

Adeegsiga kambaska (qalab dhamaystiran oo ka kooban saddex – xagalo, laydiyo, labajibaaranayaal, goobo, l. w. m oo ku jira sanduuq yar) iyo mastarad oo aad ku dhisi doontaan saaddex – xagallada. Saddex – xagallada isku sar go’an waa kuwo lagu qeexi doono lana tijaabin doono. Bedka saddex – xagallada xagasha qumman iyo wareega saddex – xagallada ayaa la xisaabin (shaqayn) doonaa, iyo halbeega bededka oo hal qaab loogu bedeli doono kuwo kale. Ugu dambayntii waxaad qiimo u samayn doontaan muga Biriisam laydiyeedyada Halbeegyada mugana hal qaab ayaad u bedeli doontaan kuwo kale.

6.1 XAGLAHA

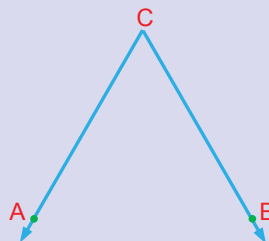
Casharkani waxaad ku aqoonsan doontaan xaglaha lidka isku ah iyo kuwa deriska ah iyo kuwa iska soo horjeeda iyo go’aansashada xaglaha isdhamaystira iyo kuwo is buuxsha.

Naqtiinka Layliska 6.1

1 Jaantuska 6.1 tilmaan

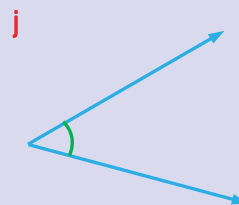
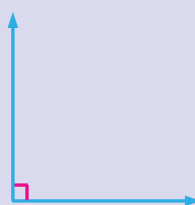
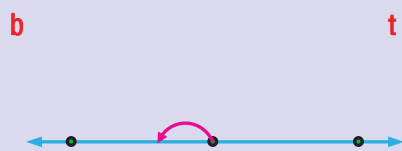
b Dhinacyada

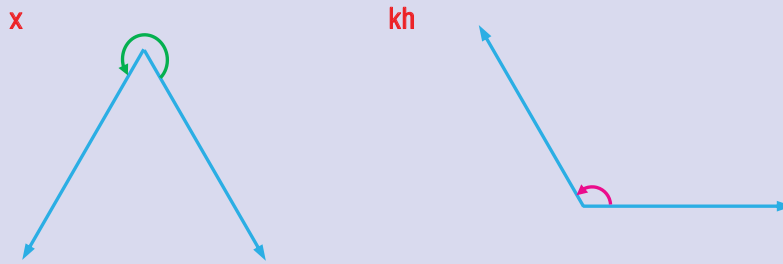
t Xagal geeska



Jaantuska 6.1

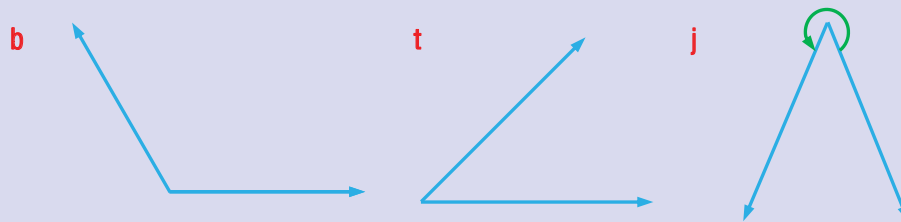
2 Jaantuska 6.2 tilmaan xagal kasta oo soo socota midkay tahay: xagal-fiiqan, xagal-qumman, xagal-daacsan, xagal-toosan iyo xagal-noqod.





Jaantuska 6.2

3 Jaantuska 6.3 Cabbir xagal kasta adiga oo adeegsnaya xaglo beeg.



Jaantuska 6.3

4 Tilmaan xaglahan soo socda mid kasta xagasha uu yahay ee xagal-fiiqan, xagal – qumman, xagal – daacsan, xagal toosan, iyo xagal noqod:

| | | | | | | | |
|-----------|------|----------|-----|----------|-----|----------|------|
| b | 203° | t | 37° | j | 91° | x | 180° |
| kh | 350° | d | 90° | r | 1° | | |

5 Waa maxay nooca xariiqaha ee xariiqaha barbarada ah? Xariiqaha is gooyana?

6.1.1 Xaglaha Isla Xidhiidha

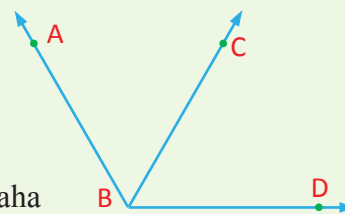
Hawlgalka 6.1

1 Jaantuska 6.4

b waa maxay dhinaca ay wadaagaan $\angle ABC$ iyo $\angle CBD$?

t Ma kuwo aan wadaagin dhinacyadaa xaglaha $\angle ABC$ iyo $\angle CBD$ miyay sameeyaan xariiq toosan?

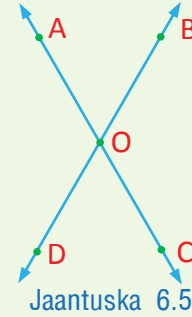
j Miyey leeyihiin Magac u gaar ah lammaanaha $\angle ABC$ iyo $\angle CBD$?



Jaantuska 6.4

2 Jaantuska 6.5

- b i** Waa maxay dhinaca ay wadaagaan xaglaha $\angle AOD$ iyo $\angle AOB$?
Waa maxay geeska ay wadaagaan xaglaha $\angle AOD$ iyo $\angle AOB$?
- ii** Waa imisa wadarta cabbiraada xaglaha $\angle AOD$ iyo $\angle AOB$?
- t i** Ma leeyihiin xaglahani $\angle AOB$ iyo $\angle BOC$ dhinac ay wadaagaan iyo gees ay wadaagaan?
- ii** Waa imisa isku darka cabbiraada xaglaha $\angle AOB$ iyo $\angle BOC$?
- j** Miyey is le'eg yihiin cabbirka xaglaha $\angle AOD$ iyo $\angle BOC$?
- x** Maxaad ugu yeedhaa lammaanaha xaglahan $\angle AOD$ iyo $\angle BOC$?
- kh** Ma jiraan xaglo lammaan oo kale oo sameeyay geeska 0 oo ka duwan xaglahan $\angle AOD$ iyo $\angle BOC$ oo leh cabbiro is le'eg?



Xaglaha waxaad u kala saari kartaan lammaanayaal:-

Qeexid 6.1: Laba xaglood oo wadaaga dhinac, gees oo aan wadaagin baraha gudaha ayaa loo yaqaanaa xaglo-deris ah.

Tusaale 1: Jaan 6.4 Lamaanaha $\angle ABC$ iyo $\angle CBD$ waxay leeyihiin dhinac ay wadaagaan oo ah \overline{BC} iyo gees ay wadaagaan oo ah B sidaa darteed $\angle ABC$ iyo $\angle CBD$ waa xaglo deris ah.

Qeexid 6.2: Laba xaglood oo deris ah oo aan wadaagin dhinacyada sameeyana xariiq toosan ayaa loo yaqaanaa lammaanaha xaglaha deriska ah ee toosan.

Tusaale 2: Jaantuska 6.5 Dhinacyada ma wadaagaan $\angle AOD$ iyo $\angle AOB$ dhinacyadoodu waa \overline{OD} iyo \overline{OB} waxayna sameeyaan xariiq toosan. Sidaa awgeed $\angle AOD$ iyo $\angle AOB$ waa lammaanaha xaglaha deriska ah ee toosan.

Markii ay laba xariiqood oo toosani ay iska gooyaan hal bar ah waxay sameeyaan afar xaglood. Jaantuska 6.5, \overline{BD} iyo \overline{AC} waxay iska gooyaan barta. Sameeyana afar xaglood $\angle AOD$, $\angle BOC$, $\angle COD$ iyo $\angle AOB$.

Jaan 6.5 Xaglaha $\angle AOB$, iyo $\angle COD$ iyo $\angle BOC$ iyo $\angle AOD$ waxaa loo yaqaan xaglaha qotonka ah ee iska soo horjeeda.

Jaan 6.5 markii xaglaha $\angle AOB$ iyo $\angle BOC$ ay yihiin lammaane xaglo deris ah oo toosan, kolkaa $m(\angle AOB) + m(\angle BOC) = 180^\circ$.

Si la mid ah, makrii $\angle BOC$ iyo $\angle COD$ ay yihiin lammaane xaglo deris ah oo toosan kolkaa $m(\angle BOC) + m(\angle COD) = 180^\circ$.

Sidaa darteed $m(\angle AOB) + m(\angle BOC) = m(\angle BOC) + m(\angle COD)$ haddii aad ka jartid $m(\angle BOC)$ labada dhinacba waxaad haysataa

$$m(\angle AOB) = m(\angle COD)$$

Ka dood markaa $m(\angle BOC) = m(\angle AOD)$

Xaglaha iska soo horjeeda way is le'eg yihiin

Hawlgalka 6.2

- 1 Ahmiyada sii Lammaanayaasha xaglah a ah ee soo socda
($20^\circ, 70^\circ$), ($30^\circ, 60^\circ$), ($10^\circ, 80^\circ$) iyo ($2^\circ, 88^\circ$)
 - b Xaglaha lammaane kasta isku gee
 - t Maxay wadaagan xaglaha lammaanayaasha ahi?
 - j Raadi qaar kale oo xaglaha lammaanayaasha ah kuwaas oo ay isku mid yihiin kuwii kor la inagu soo siiyay.
 - x Xaglahaani magacyo u gaara ma leeyihiin?
- 2 U tix geli lammaanayaasha xaglaha ah ee soo socda:
($30^\circ, 150^\circ$), ($1^\circ, 179^\circ$), ($60^\circ, 120^\circ$), ($90^\circ, 90^\circ$)
 - b Lammaane kasta isku gee.
 - t Wax u gaar ah oo ay wadaagaan lammaanaha xaglahani ay leeyihiini waa maxay?
 - j Raadi qaar kale a lammaamid yihiin oo laynagu siiyay kor?
 - x Lammaanayaasha xaglahan maleeyihiin magacyo u gaara?

Qeexida 6.3: Xaglaha lammaan waxaa ladhahaa xagla isbuuxsha goortii wadarta cabirkoodu noqdo 90° .

Tusaale 3: Ma lammaane is buuxsha baa 30° iyo 60° ?

Furfuris: Markii $30^\circ + 60^\circ = 90^\circ$, kolkaa 30° iyo 60° waa kuwo is buuxsha.

Qeexida 6.4: Haddii labada xaglood ee α iyo β ay yihiin kuwo isbuuxsha, kolkaa α waxaa loo yaqaanaa buuxshaha β (lidkeeduna waa la mid)

Tusaale 4: Raadi dhamaystiraha 57°

Furfuris: x u qaado dhamaystiraha 57° , kolkaa $x + 57^\circ = 90^\circ$

$$\text{Sidaa awgeed } x = 90^\circ - 57^\circ$$

$$\text{Sidaa darteed buuxshaha } 57^\circ \text{ waa } 33^\circ$$

Qeexida 6.5: Xaglaha lammaani hadii ay yihiin kuwo isdhamaystira markaa isku darka cabbirkoodu waa 180°

Tusaale 5: Miyey is buuxshaan 20° iyo 170° ?

Furfures: Markii $20^\circ + 170^\circ = 190^\circ \neq 180^\circ$, kolkaa 170° iyo 20° ma aha xaglo is dhamaystira.

Qeexida 6.6: Haddii labada xaglood ee y iyo θ ay yihiin xaglo isdhamaystira, kolkaa y waxa loo yaqaanaa buuxiyaaha θ sidoo kalena θ waa dhamaystira y .

Tusaale 6: Raadi dhamaystiraha 35° ?

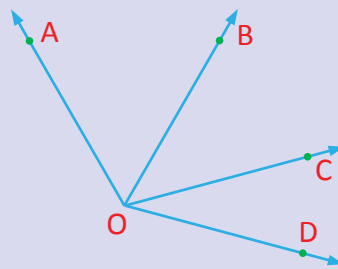
Furfuris: U qaado buuxiyaha 35° inuu yahay y kolkaa $y + 35^\circ = 180^\circ$.

$$\text{Markaa waxaad heli } y = 180^\circ - 35^\circ = 145^\circ$$

$$\text{Sidaa awgeed dhamaystiraha } 35^\circ \text{ waa } 145^\circ$$

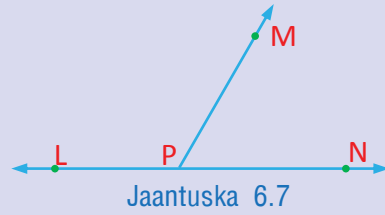
Layliska 6.2

1 Jaantuska 6.6, Magacaw 3 lammaanayaal oo xaglo deris ah



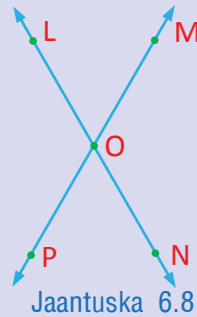
Jaantuska 6.6

- 2 Jaantuska 6.7, xaglaha $\angle NPM$ iyo $\angle MPL$ waa laba xaglood oo deris ah oo lammaane toosan ah hadii cabbirka $\angle MPL$ uu yahay 137° , waa imisa cabbirka $\angle NPM$?



- 3 Haddii α iyo β ay yihiin dhamaystiraha iyo buuxiyaha 32° siday u kala horeeyaan raadi α iyo β ?

- 4 Jaantuska 6.8, \overline{LN} iyo \overline{MP} waxay iska gooyaan barta O, hadii $m(\angle LOM) = 46^\circ$, raadi cabbirka:



- b $\angle NOP$
- t $\angle MON$
- j $\angle LOP$

- 5 Haddii α iyo β ay yihiin laba xaglood oo isdhamaystira ku min guuri tusahan hoose oo ku buuxi meelaha banaan ee xaglaha ku haboon.

| | | | | |
|----------|------------|------------|------------|------------|
| α | | 69° | | 47° |
| β | 32° | | 24° | |

- 6 Haddi y iyo θ ay yihiin labo xaglood oo isdhamaystira ku minguuri tusahan hoose kuna buuxi meelaha banana ee xaglaha ku haboon.

| | | | | |
|----------|-------------|-------------|-----------------------|---------------|
| α | 140° | 12° | $24\frac{1}{2}^\circ$ | |
| θ | | 168° | | 154.5° |

- 7 Hoos u taxyada A iyo B cabbiraadyada xaglaha qaarkood adaa lagu siiyay lammaane ka dhig hab lamid ah lammaaneyaasha sameeya xaglaha is buuxsha.

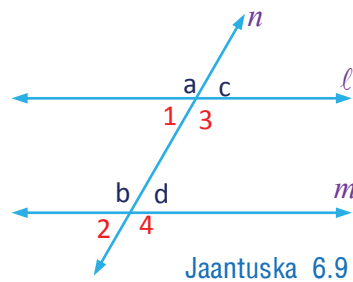
| | A | | B |
|-----|-------------|-----|-------------|
| i | 20° | b. | 72° |
| ii | 36° | t. | 133° |
| iii | 47° | j. | 154° |
| iv | 26° | x. | 160° |
| v | 108° | kh. | 144° |

- 8 Waa noocee xagasha buuxisa xagal daacsan?
- 9 Sawir laba xaglood oo wadaaga dhinac laakiin aan deris ahayn?
- 10 Haddii θ uu yahay buuxiyaha β , β na uu yahay buuxiyaha δ , maxaad ku soo gabagabayni xiriirka ku saabsan baaxada xaglaha θ iyo δ ?

6.1.2 Xariiqaha Barbarada ah iyo Xaglaha

Qeexida 6.7: Xariiqka ka gudba laba iyo in ka badan o xariiqood ayaa loo yaqaanaa gudbane

Jaantuska 6.9: Xariiqan wuxuu ka gudbaa xariiqaha ℓ iyo m , sidaas awgeed waa gudbane.



Markii gudbanuhu ka gudbo laba xariiqood 8 xagloodbaa ka samaysma. Lammaane kasta oo xaglaha lagu siiyay waxay leeyihiin magac u gaar ah.

Jaantuska 6.9: ee sare xariiqaha ℓ iyo m waxaa ka gudba gudbanaha oo ay ka samaysmaan 8 xaglood oo kala duwan. Xaglahaas waxaa lagu magacaabaa lamaaneyaasha soo socda

- 1 Xaglaha lammaan ee a iyo b, 1 iyo 2 c iyo d 3 iyo 4 waxaa loo yaqaanaa xaglo gudboon .
- 2 Xaglaha lammaan ee 1 iyo d, iyo 3 iyo b waxa loo yaqaanaa xaglo – gudeed talantaali ah.
- 3 Xaglaha lammaan ee a iyo 4, iyo c iyo 2, waxaa loo yaqaanaa xaglo – dibadeed talantaali ah.
- 4 Xaglaha lammaan ee a iyo 2, iyo c iyo 4 waxaa loo yaqaanaa xaglo dibadeed waxayna gudbanaha kaga yaalaan dhinac isku mid ah.
- 5 Xaglaha lammaan ee 1 iyo b, 3 iyo d waxaa loo yaqaanaa xaglo gudeed waxayna gudbanaha kaga yaallaan dhinac isku mid ah.

Fasalka 5^{aad} waxaad ku soo barateen waxa ay yihiin xariiqaha barbarada ahi iyo sida loo sawiro iyada oo la adeegsanayo qalabka Afar – geeska ah iyo mastarad. Casharkan waxaad ku cadeyn doontaan dhacdooyinka kala duwan ee ku saabsan xaglaha ka samaysma Markii laba xariiqood oo barbaro ah uu ka gudbo gudbanuhu.

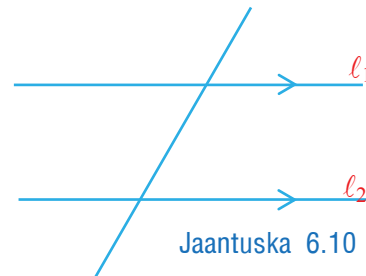
Xusuusnow! Laba xariiqood oo toosan oo dhaca sallax isku mida waa barbaro. Haddii ayna weligoodba kulmayn marka laxariiqo ama ay samaysmaan. Haddii l_1 iyo l_2 ay yihiin laba xariiq oo barbaro ah waxaan u qori karnaa $l_1 \parallel l_2$

Hawl-galka 6.3

- 1
 - b** buuggaaga qorista ku sawir xariiqda l . Qaado bar kasta oo aan dhinacnaba ku dul oolin xariiqda “ l ” uguna yeedh “P”.
 - t** Isticmaal qalabka Afar geeska ah iyo Mastarad kuna sawir xariiq dhex Marta “P” oo barbaro la ah “ l ”.
 - j** Sawir xariiq marta barta “P” oo gudbane ah kaas oo gooya xariiqda “ l ”.
 - x** Qaado lammaane kasta oo xaglogudeed talantaaliya ee uu sameeyay gudbanuhu kadibna cabbir. Miyey isle’eg yihiin ama kala duwanyihiin?
 - kh** Qaado lammaane kasta oo xaglo dibadeed talantaaliya ee uu sameeyay gudbanuhu kadibna cabbir. Miyey isle’eg yihiin ama kala duwan yihiin?
 - d** Qaado lammaane kasta oo xaglo gudboon ah ee uu sameeyay. Gudbanuhu kadibna. Cabbir miyey isle’eg yihiin?
 - r** Cabbir lammaane kasta oo xaglo gudeed ah ee dhinacyada isku mid ka ah ee uu sameeyay gudbanuhu kadibna isku gee. Wadartoodu waa imisa?
- 2 Laga bilaabo **x**, **kh**, **d** iyo **r** waa maxay ahmiyada aad gebagebadii ku samaynaysid?

Xaqiiqooyin:- Markii labada xariiqood oo barbarada ah l_1 iyo l_2 uu kagudbo gudbanuhu:

- 1 Xaglaha gudboon way isleeg yihiin.
- 2 Xaglo-gudeedka talantaaliga ahi way isle’eg yihiin.
- 3 Xaglo-dibadeedka talantaaliga way isleeg yihiin.
- 4 Xaglo-gudeedka gudbanaha dhinacyada isku midka ah kaga yaal waa xaglo is buuxsha.



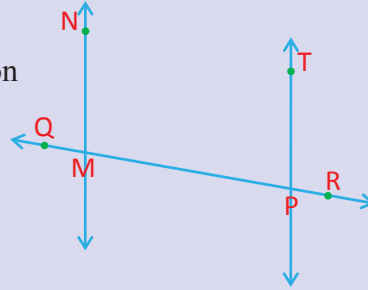
Layliga 6.3

1 Jaantuska 6.11

b Magacow lammaanaha xaglaha gudboon

t Markeebay is le'ekaanayaan cabbirada

$\angle NMQ$ iyo $\angle TPM$

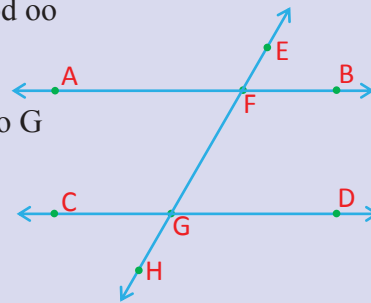


Jaantuska 6.11

2 Jaantuska 6.12 \overline{AB} iyo \overline{CD} waa labo xariiqood oo

barbaro ah. Hada m ($\angle BFG = 108^\circ$, raadi

dhamaan xaglaha kale ee ay sameeyeen F iyo G



Jaantuska 6.12

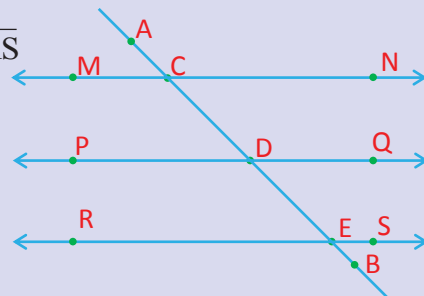
3 Jaantuska 6.13 Xariiqaha \overline{MN} , \overline{PQ} iyo \overline{RS}

waa saddex xariiqood oo barbaro ah

Gudbanaha \overline{AB} ayay ku kulmaan C,

D iyo E. Haddii m ($\angle REB = 135^\circ$,

waa imisa cabbiraka $\angle ACM$?



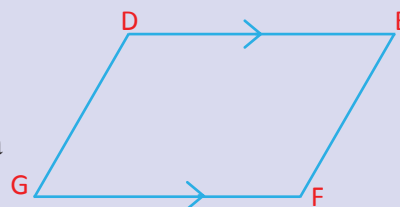
Jaantuska 6.13

4 Jaantuska 6.14 \overline{DE} waxay barbaro yihiin

\overline{GF} iyo \overline{DG} oo barbaro la ah \overline{EF} Haddii

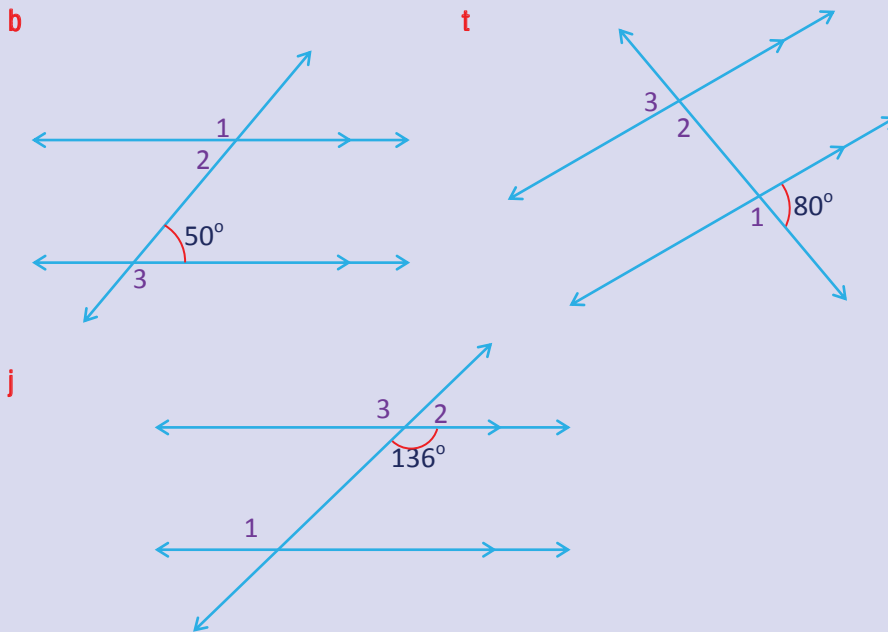
m ($\angle DEF = 73^\circ$, raadi cabbirada xaglaha

hadhay ee Afar geeslahan.



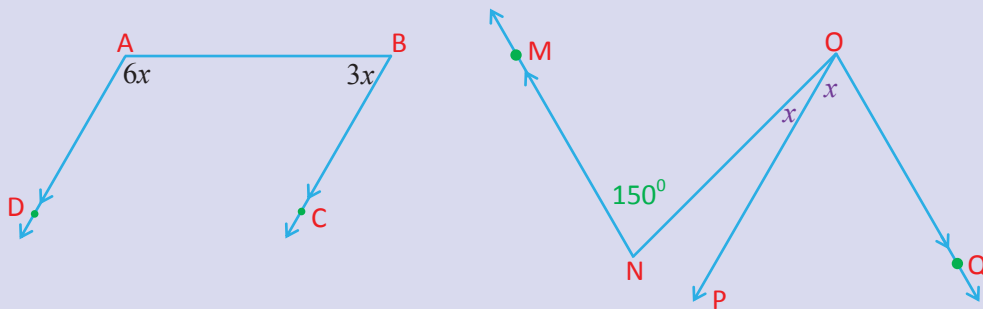
Jaantuska 6.14

5 Jaantuska 6.15, Soo saar xaglaha lagu calaamadiyay 1, 2 iyo 3 (Falaadha madaxyada xariiquhu waxay ku tusinaysaa xariiqaha barbarada ah)



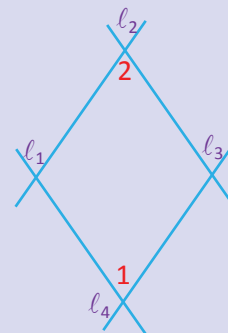
Jaantuska 6.15

- 6 Jaantuska 6.16 yadan hoose ee lagu siiyay. Falaadha madaxyada xariiquhu waxay ku tusi inay xariiquhu barbaro yihiin. Raadi qiimaha x.



Jaantuska 6.16

- 7 Jaantuska 6.17: l_1 waxay barbaro yihiin l_2 iyo l_3 oo ay barabro yihiin l_4 , haddii cabbirka 1 yahay 70° , waa imisa cabbirka 2?

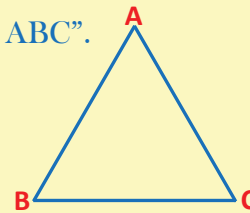


Jaantuska 6.17

6.2 DHISIDA SADDEX-XAGALLADA

Fasalladii hoose waxaad ku soo barateen sida loo kala badho xariiq gobolgobol loo qaybshay iyo xagal, loo adeegsanayo lammaanaha xagal – beega iyo geeska toosan. Halkan waxaad ku baran doontaan casharkan sida loo dhiso saddex – xagal lagu siiyay cabbiradiisa iyo qaar kamid ah ku tirsaneyaashiisa loo adeegsaday lammaanaha xagal – beega iyo geeska toosan.

Xusuusnow! Saddex-xagalku waa jaantus oodan oo ka samaysan 3 xariijimood wuxuu leeyahay 3 xaglood, 3 Gees iyo bed-oodan waxaana lagu magacaabaa xarfaha geesaha. Haddii A, B iyo C ay yihiin xarfaha geesaha, kolkaa halka jid ee magacaabida saddex – xagalka loo marayaa A, B iyo C waa $\triangle ABC$ oo loo akhrinayo “Saddex – xagalka ABC”.



Jaantuska 6.18

Inta aydaan dhisin saddex – xagal kahor bal aynu dhiso laba dhisitaan oo fudud inagoo adeegsanayna xagal – beegyada lammaan iyo geeska toosan.

Dhisida I:

Siin: Xariijinta AB iyo Xariiq l oo lagahelo barta P.

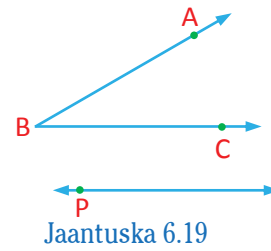
Si aynu u dhiso xariijin “ l ” dusheeda oo ku began barta p taasoo dhererka \overline{AB} le’eg.

| Talaabooyinka dhisitaanka | Dhisida |
|--|---------|
| Talaabo 1: U adeegso A xudunta iyo gacan le’eg dhererka \overline{AB} sawir qaansada goobada | |
| Talaabo 2: P oo ah xudunta lana mid ah gacanka sidii talaabadii 1, sawir qaansada goobada oo ay “l” ka goyso barta “Q”. | |
| Talaabo 3: Kolkaa \overline{PQ} , waxay leedahay dherer le’eg \overline{AB} . | |

Dhisitaanka 2:

Siin: Xagasha ABC iyo xariiq ℓ oo ka kooban barta P.

Sida loo dhiso: Xagasha ku beeg barta P mid ka mid ah dhinacyadiisa oo ah ℓ lana mid ah cabbirka xagasha leh $\angle ABC$.



| Talaabooyinka dhisida | Dhisitaanka |
|---|-------------|
| <p>Talaabo 1: u adeegso B xudunta iyo gacan kastoo haboon sawir goobo – gobol oo ay ka goynayso dhinacyada $\angle ABC$ ee R iyo S.</p> | |
| <p>Talaabo 2: U adeegso P xudunta iyo gacanka oo la mid ah sida talaabada 2, sawir goobogobol oo ay ℓ iska gooyaan barta E.</p> | |
| <p>Talaabo 3: Sawir goobo gobol oo leh “S” oo xudunta ah iyo dhererka \overline{SR} oo ah gacanka.</p> | |
| <p>Talaabo 4: Sawir goobo gobol oo leh “E” oo ay ku qotonto “ℓ” oo ah xudunta iyo dheerina \overline{SR} oo ah gacanka goobada gobol oo ay isku gooyaan barta “D” talaabadii 2.</p> | |
| <p>Talaabo 5: Adeegso geeska toosan kuna sawir \overline{PD}, kolkaa $\angle DPE$ waxay le’eg tahay $\angle ABC$.</p> | |

Koox - hawleedka 6.1

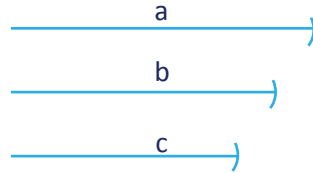
- 1 **b** Adeegso mastarad kuna sawir xariijinta dhererkeedu yahay 5cm
- t** Adeegso xagal – beeg iyo mastarad ku min guuri xariijinta “a”.
- 2 **b** Adeegso goobo – beeg sawir xagal cabbirkeedu yahay 90° .
- t** Adeegso xagal – beeg iyo Masarad kuna min guuri xaga a.

Hadda Waxaad arki doontaan sida loo dhiso saddex – xagallada markii qaar ka mid ah ku tirsanayaasha saddex – xagalka lagu siiyay.

Dhisida 3:

Siin: Saddex dhinac oo ka mid ah saddex – xagal leh dhererada halbeegyada a , b , iyo c .

Sida loo dhiso: Saddex – xagal leh dhererka dhinacyada a , b iyo c .



Jaantuska 6.20

| Talaabooyinka dlusida | Dhisitaanka |
|---|-------------|
| Tal 1: Sawir xariiqda l kana dooro barta P oo ku qotonta “ l ”. | |
| Tal 2: Barta P ku dhixxariijin ay is le’eg yihiin dhererka xariijinta ee dhererkeedu yahay “ a ” halbeeg. | |
| Tal 3: P U adeegso P inay tahay xudunta halbeega “ c ” uu yahay gacanka sawir goobo – badhkeed oo ka saraysa xariiq “ l ”. | |
| Tal 4: U adeegso Q xudunta halbeega “ b ” gacanka. Sawir goobo – badhkeed oo goysa goobo- badhkeeda talaabadii 3 ^{aad} ee barta “R”. | |
| Tal 5: Sawir \overrightarrow{RP} iyo \overrightarrow{RQ} , kolkaa $\triangle PQR$ waa saddex – xagal dhinacyadiisu yihiin dhererka halbeegyada a , b , iyo c . Inta aydaan arag dhisitaanada kale ka hor, bal aynu eegno xiriirka ka dhex jira dhinacyada saddex – xagalka. | |

Hawlgalka 6.4

- Adiga oo adeegsanaya xaglo-beeg iyo mastarad ma dhisi kartaa sadex- xagla leh saddexdan tiro ee soo socda?

| | | |
|----------------------|---------------------|---------------------|
| b (1, 2, 3) | t (2, 2, 4) | j (6, 7, 12) |
| x (1, 2, 1.5) | kh (2, 2, 3) | d (6, 6, 6) |
- Saddex kasta oo horsan oo ka mid ah su'aasha (1) ee sare, ku dar laba tiro oo yaryar wadartoodana barbardhig tirada 3^{aad} , ma wadarta labada tiro ayaa ka wayn tirad 3^{aad} ?
- Haddii b , t iyo j ay yihiin tirooyin saddex-gees ah, kaas oo sameeya dhererka dhinacyada saddex-xagalka, is bar bar dhig

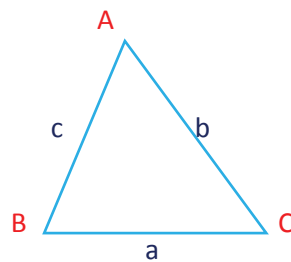
| | | |
|------------------|------------------|------------------|
| b $b + t$ | t $b + j$ | j $t + j$ |
|------------------|------------------|------------------|
- Markii lagu diro inaad ka soo shaqaysid tirooyinka dhererka dhinacyada saddex-xagal, waa maxay xaaladaha ugu muhiimsan ee aad ka fakaraysid inay tirooyinkan lakulansiyo?

Hawlgalka 6.4 wuxuu kuu horseedayaa inay aad iyo aad muhiim u tahay dhiraandhirinta Joomaterigu.

Saddex-Xagal aan isle'ekayn

Saddex-xagal kastaa, wadarta dhererka laba. Dhinac oo kasta waxaay ka wayn yihiin dhererka dhinaca saddexaad. Taas oo ah, hadii a , b iyo c ay yihiin dhererka dhinacyada saddex-xagal lagu siiyay ee ABC, kolkaa $a + b > c$,

$$a + c > b \text{ iyo } b + c > a.$$



Jaantuska 6.21

Sidaa darted markii lagu diro in aad ka soo shaqaysid tirooyinka dhererka dhinacyada saddex-xagal, waa inaad hubisid inay tirooyinku qancinayaan saddex-xagal isma le'eka ah. .

Laylis 6.4

- 1** Adiga oo adeegsanaya xaglo – beeg iyo Mastarad dhis saddex – xagal kasta oo leh dhinacyadan lagu siiya
- | | | | |
|----------|-----------------|----------|---------------|
| b | 3cm, 4cm fi 5cm | t | 6cm, 6cm, 6cm |
| x | 5cm, 4cm fi 9cm | j | 8cm, 4cm, 5cm |
- 2** Tirooyinka saddex – geesoodka ah waa kee ka laguu diri karo inaad ka shaqaysid dhererka dhinacyada saddex – xagal?
- | | | | |
|-----------|-------------------|----------|------------------|
| b | (3cm, 2cm, 2.5cm) | t | (3cm, 4cm, 8cm) |
| j | (6cm, 6cm, 6cm) | x | 5cm, 4cm, fi 9cm |
| kh | (8cm, 4cm, 5cm) | | |
- 3** Haddii a iyo b yihiin dhererka dhinacyada saddex-xagal lagu siiyay. Tirooyinkan soo socda kee baa noqon kara dhererka dhinaca 3^{aad}?
- | | | | |
|------------|---|-----------|-------|
| b | $a = 4\text{cm}$ iyo $b = 5\text{cm}$ | | |
| i | 7cm | ii | 10cm |
| iii | 9cm | | |
| t | $a = 3.6\text{cm}$ iyo $b = 4.4\text{cm}$ | | |
| i | 8.1 cm | ii | 8cm |
| iii | 2cm | | |
| j | $a = 2.5\text{cm}$ fi $b = 6.5\text{cm}$ | | |
| i | 4.5cm | ii | 1.5cm |
| iii | 9cm | | |

Saddex-xagalka waxaa kale oo lagu dhisi karaa markii labada dhinac iyo xagasha. Ku jirta ee u dhaxaysa labadaas dhinac ee lagu siiyaay.

Dhisida 4:

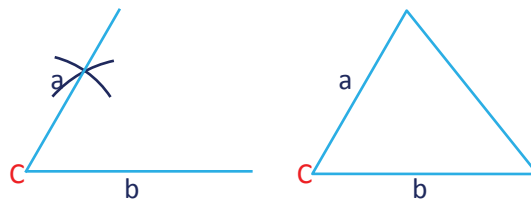
Siin: labada dhinac ee a iyo b ,
xagasha ku jirta ee $\angle C$ ee u
dhaxaysa dhinacyadaas,



Jaantuska 6.22

Sida loo dhiso: Saddex – xagal leh ku tirsanayaasha sare.

Sawir gacmeed:



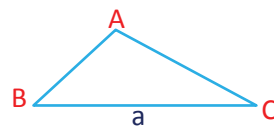
Jaantuska 6.23

| Talaabooyinka Dhisida | dhisitaanka |
|---|-------------|
| Talaabo 1: Sawir xariiq? Dooro barta C ay qotonto? | |
| Talaabo 2: Dhis xariijinta oo leh C oo leh hal bar dhamaad oo xariijinta dhererkeedu yahay halbeega “b” | |
| Talaabo 3: Barta C ka dhis xagal cabbirkeedu le’eg yahay $\angle C$ uguna yeedh natiijada xariijinta “m” | |
| Talaabo 4: Dhis xariijinta leh “C” oo leh hal bar dhamaad, xariijinta ku qotonta oo ah “m” oo leh dherer “a” halbeeg | |
| Talaabo 5: Sawir xariijinta \overline{QR} kolka $\triangle RCQ$ waa saddex – xagalkii loo baahnaa. | |

Sidoo kale waxaad u dhisi karta saddex – xagalka markii labo kasta oo xaglood oo ay ku jirto dhinaca saddex – xagal lagu siiyay. Talaabooyinku waa kuwan hoos lagu siiyay.

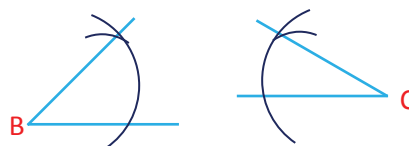
Dhisida 5:

Siin: Labada xaglood ee B iyo C oo ay ku jirto dhinaca ka dhexeeya xaglahaas ee dhererkeedu yahay a halbeeg in la dhis: saddex – xagal leh ku tirsaneyaasha sare.


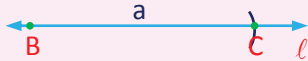
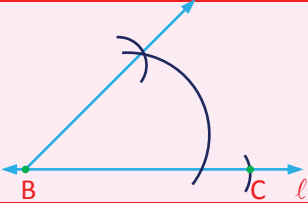
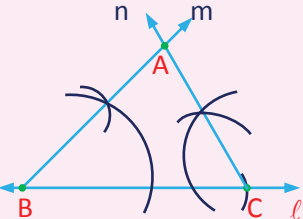
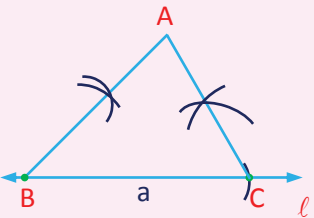


Jaantuska 6.24

Sawir gacmeed:



Jaantuska 6.25

| Talaabooyinka Dhisida | Dhisitaanka |
|--|--|
| Talaabo 1: Sawir xariiq? Dooro barta B oo ku qotonta l |  |
| Talaabo 2: dhis xariijinta Barta B dhererkeedunaya hay "a" halbeeg uguna yeedh bar dhamaadka C |  |
| Talaabo 3: Dhis xagasha barta B oo cabirkeedu le'eg yahay $\angle B$ |  |
| Talaabo 4: Dhis xagasha barta C oo cabirkeedu le'eg yahay $\angle C$ halkay ay iska gooyaan m iyo n ha noqoto a |  |
| Talaabo 5: Halka ay iska gooyaan m iyo n waxay noqon doonta geeska saddexaad ee saddex – xagalka. Ugu yeedh A kolkaa $\triangle ABC$ waa saddex – xagalkii loo baahnaa. |  |

Xidhiidhka Ka dhexeeya Dhinacyda iyo Xaglaha saddex-xagal

Kahor inta aydaan soo gabagabayn casharkan, bal aynu fiirino xidhiidhka ka dhexeeya dhinacyada iyo xaglaha saddex-xagalka.

Hawlgalka 6.5

- 1 Idinka oo adeegsanaya xagal beeg iyo Mastrad dhisa sadex -xagaladan soo socda ee leh dhererka lagu siiyay.

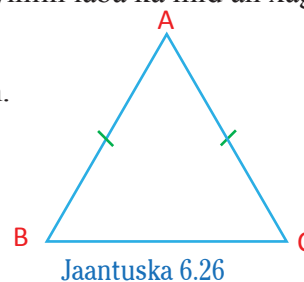
| | |
|-------------------------------|---------------------------|
| b 2cm, 2cm, 3cm | t 5cm, 5cm, fi 6cm |
| j 10cm, 11cm, fi 10 cm | x 6cm, 6cm fi 6 cm |
- 2 Su'aasha (1) ee sare cabira xaglaha ka samaysmay dhinacyada leh dhererka isku midka ah iyo dhinaca 3^{aad} ee loo adeegsaday qalabka xagal – beega. Waa maxay dhiraandhirinto aad ku samayseen?

- 3** Idinka oo adeegsanaya xagal beeg iyo mastarad dhisa sadex – xagaladan soo socda talaabo kasta oo aad qaadaanba cabira 3da xaglood ee xagal beega ka samaysmay.
- b** 3cm, 4cm, 5cm **t** 6cm, 7cm, 8cm
- j** 11cm, 15cm, 16cm
- 4** Suaasha (3) ee sare :
- b** Ma dhinaca ugu gaaban baa ka soo horjeeda xagasha ugu yar?
- t** ma dhinaca ugu dheer baa ka soo horjeeda xagasha ugu wayn?
- j** Ma xagasha ugu wayn baa ka soo horjeeda dhinaca ugu dheer?
- x** Maxagasha ugu yar baa ka soo horjeeda dhinaca ugu gaaban?
- 5** Dhis 3 saddex – xagal siman. Cabir xaglaha soona saar xidhiidhka ka dhexeeya. Natiijada warqad wayn oo adag ku qor.
- 6** Dhis 3 saddex – xagal aan sinayn cabirna xaglahooda. Miyaad hesheen laba xaglood oo kasta oo isleeg oo sadex - xagal?

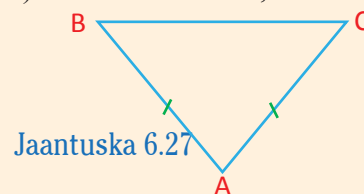
Hawlgalka sare hubiya sadax – xagalada soo socda ee muujinaya Muhimada xidhiidhada ka dhaxeeya dhinacyada iyo xaglaha saddex - xagalka.

Saddex – xagal – labaale ahi waa ka ay is le'eg yihiin laba ka mid ah xaglihiisu

Taasi oo ah: hadii $AB = AC$ kolkaa,
 $\angle ABC$ iyo $\angle ACB$ cabbiro is le'eg ayay leeyihiin.



Tusaale 1: Jaantuska 6.27 hadii $AB = AC$ iyo $m(\angle ABC) = 50^\circ$ hel cabirka, $\angle ACB$?



Furfuris: Maadaama $\triangle ABC$ uu yahay sadex -xagal labaale ah sidaa darted $AB = AC$, kolkaa xaglaha iska soo horjeeda dhinacyadu waa inay is le'ekaadaan.

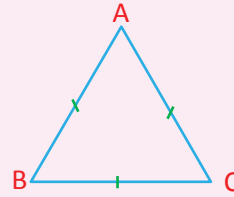
Taasoo $m(\angle ABC) = m(\angle ACB)$

Kolka $m(\angle ABC) = 50^\circ$, S/awgeed $m(\angle ACB) = 50^\circ$

Saddex – xagalka siman waa saddex – xagalka ay 3 diisa xaglood is leegyihin.

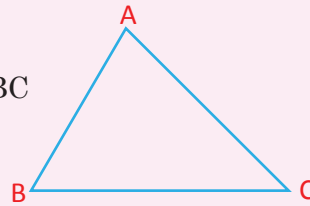
Taasoo, hadii $AB = AC = BC$,

Kolkaa $m(\angle A) = m(\angle B) = m(\angle C) = 60^\circ$



Jaantuska 6.28

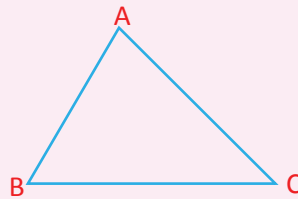
- 1 Sadex-xagal ka aan sinayn wuxuu leeyahay saddex xaglood oo aan sinayn ama aan is le'ekayn. Taasoo oo ah $\triangle ABC$ Haddii $AB \neq BC \neq CA$ kolkaa $m(\angle A) \neq m(\angle B) \neq m(\angle C)$ ta'e,



Jaantuska 6.29

- 2 Haddii labada xaglood ee dhinacyada iska soo horjeeda ayna isle'ekayn waa saddex-xagal isma le'eke ah dhinaca ka soo horjeeda xagasha ugu wayn waa dhinaca ugu dheer.

Taasoo ah $\triangle ABC$, haddii $m(\angle C) > m(\angle B)$ kolkaa $AB > AC$



Jaantuska 6.30

- 3 Haddii labada dhinac ee saddex-xagalku uu yahay mid aan isle'ekayn xaglaha iska soo horjeeda ee dhinacyadaasi waa kuwo aan isle'ekayn iyo xagasha ka soo horjeeddaa dhinaca ugu dheer oo ah xagasha ugu wayn.

Laylis 6.5

- 1 Adiga oo adeegsanaya xagal-beeg iyo Mastaradba dhis saddex- xagalladan soo socda mid kasta, Markii labada dhinac ee ay xagashu ku jirto lagu siiyay. Raadi xaglaha iyo dhinaca saddex-xagalka soo hadhay adiga oo cabbiraya

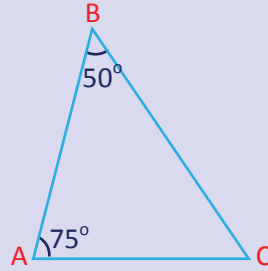
b $a = 3\text{cm}$, $b = 4\text{cm}$ iyo $\angle C = 40^\circ$

t $a = 5\text{cm}$, $b = 6\text{cm}$ iyo $\angle C = 50^\circ$

j $a = 6\text{cm}$, $b = 6\text{cm}$ iyo $\angle C = 60^\circ$

x $a = 6\text{cm}$, $b = 8\text{cm}$ iyo $\angle C = 90^\circ$

- 2 Dhis saddex-xagal, kaaso labadiisa xaglood oo ku jirto hal dhinac oo lagu siiyay.
- | | | | | | |
|----------|---------------|-----------|---------------|----------|----------------|
| b | 45°, 90°, 3cm | t | 60°, 60°, 5cm | j | 110°, 30°, 2cm |
| x | 40°, 40°, 6cm | kh | 60°, 90°, 3cm | d | 50°, 70°, 5cm |
| r | 40°, 90°, 3cm | s | 60°, 40°, 3cm | | |
- 3 Jaantuska 6.31 haddii $m(\angle A) = 50^\circ$ iyo $m(\angle B) = 75^\circ$, dhinacee ugu dheer? AC ama BC? Waayo?



Jaantuska 6.31

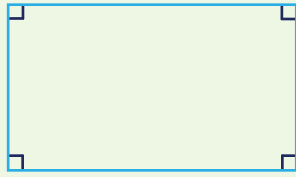
6.3 SADEXAGALLADA ISKU SAR-GO'AN

Joometarigu waa qayb aad u wayn oo khusaysa xidhidhada ka dhex jira dhinacyada iyo xaglaha saddex-xagalka. Casharkan waxaad ku falanqayn doontaan muhimada xiriirka ka dhexeeya saddexagallada. Idinka oo u adeegsanaya ereyga “Sar-go’naanshaha.”

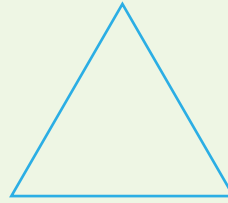
6.3.1 Isku-Sar- go’naanshaha Saddex -Xagallada

Hawlgalka 6.6

- 1 Jaantuska 6.32.
- b** labadan jaantus ma isku qaab baa?
- t** Ka minguuri mid ka mid ah labadan jaantus adiga oo adeegsanaya warqada khafiifka ah ee la dul dhigo si wax loogu sawiro si qumman oo sallaxan u kor dhig kuwa kalana. Gebi ahaanba ma ka minguurin kartaa si haboon talabaadna? Waayo?



Jaantuska 6.32

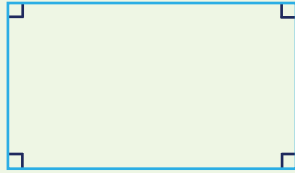


2 Jaantuska 6.33.

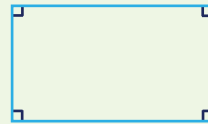
b Labada jaantus ma isku qaab baa?

t Labada jaantus baaxadoodu ma isku midbaa?

j Kaga minguuri warqad yar oo khafiif ah lana dul dhigo marka wax la sawirayo si qumman oo sallaxan u kor saar kuwa kalana. Ma ku haboonaan? Waayo?



Jaantuska 6.33



3 Jaantuska 6.34.

b labada xariijimood ma isku midbaa baaxada?

6 cm

t Mafidin karnaa xariijimaha?

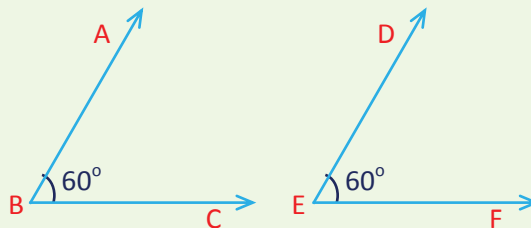
3 cm

Jaantuska 6.34

4 Jaantuska 6.35.

b Labada xaglood ma isku baaxadbaa?

t Ma fidin karnaa labada xaglood? Waayo?



Jaantuska 6.35

5 Jaantuska 6.36.

b Ma isku qaab baa labada jaantus?

- t Labada saddex-xagal miyey fidi doonaan markii si quman oo salaxan loo kor saaro kuwa kale? Maxay ku haboonaan doontaa habayntoodu?



Jaantuska 6.36

- 6 Goorma ayay kula tahay in laba jaantus oo Joomateriya gebi ahaanba isu daboolayaan (is dhamaystirayaan)?

Hawlgalka sare wuxuu si cad u muujinayaa lagama maarmaanimada fikirka cusub ee lagu magacaabo “Sar go’ naanshaha” si dareen leh uga hadlida, labada jaantus ee Joomateriyeed ee lagu sheegay sargo’naanta, haddii warqada khafiifka ah Lagaga minguuriyo ta ugu horaysa ee gebi ahaanba daboolaysa ta labaad. Marku si qoto dheer loo faahfaahiyo waxaynu helaynaa sidan soo socota.

Xusuus: Laba jaantus Joomateriyeed waxaa lagu sheegaa inay isku sar-go’an yihiin, haddii ay leeyihiin qaab iyo baaxad isku mid ah. Si aad u tilmaanto laba jaantus Joomateriyeed oo isku sar go’an, waxaynu u istic maali summadaan “ \cong ” oo loo akhryo “isku sar - goan”.

Ka hor inta aynaan qeexin isku sar go’naanshaha saddex – xagalada, bal aynu fiirino qeexida isku sargo’naanshaha xariijimaha iyo xaglaha.

- 1 Labada xariijimood ee \overline{AB} iyo \overline{CD} way isku sar go’an yihiin Waxaana loo qoraa ($\overline{AB} \cong \overline{CD}$) markii dhererka \overline{AB} iyo \overline{CD} uu is le’eg yahay soo gaabin: $AB = CD$ hadii $\overline{AB} \cong \overline{CD}$



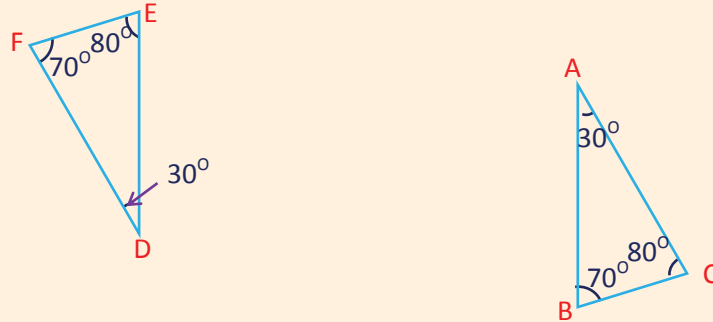
- 2 Labada xaglood $\angle ABC$ iyo $\angle DEF$ way isku sargoan yihiin, waxaana. Loo qoraa ($\angle ABC \cong \angle DEF$), markii cabirada $\angle ABC$ iyo $\angle DEF$ ay is le’eg yihiin, soo gaabin: $\angle ABC \cong \angle DEF$ markii $m(\angle ABC) = m(\angle DEF)$.



Jaantuska 6.37

Haddii laba saddex-xagal ay ku qancayaan iyadoo loo tixgelinayo xaglaha labada saddex-xagal oo isle'eg, kolkaa xaglaha is le'eg waxaa loo yaqaan xaglo gudboon (isku began) iyo dhinacyada ka soo horjeeda xaglahaas oo loo yaqaano dhinacyada gudboon.

Tusaale 1: Fiiri jaantuska 6.38 ee $\triangle ABC$ iyo $\triangle DEF$, tax xaglaha iyo dhinacyada gudboon E



Jaantuska 6.38

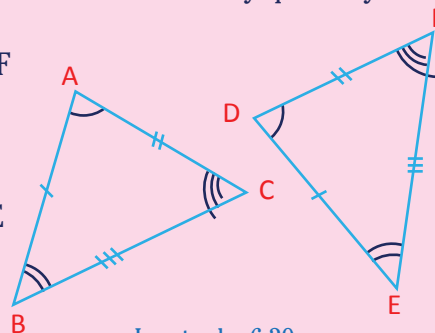
- Furfuris:**
- 1 $\angle A$ iyo $\angle D$, $\angle B$ iyo $\angle F$, iyo $\angle C$ iyo $\angle E$ waa xaglo gudboon
 - 2 \overline{BC} iyo \overline{EF} , \overline{AB} iyo \overline{DF} iyo \overline{AC} iyo \overline{ED} waa dhinacyo gudboon. Bal aynu qeexno laba saddex-xagal oo isku sargo'an.

Qeexida 6.8: Laba sadex – xagal waxaa la odhan karaa way isku sar go'an yihiin haddii geesahood is lahaan karaan sidaa darteed dhinacyada gudboon waa kuwo isku sar go'an xaglaha gudboonna sidoo kale waa kuwo isku sargo'an.

Qeexidan sare waxaynu dib ugu cadayn karnaa jaantusyadan soo socda ee ku xusan hoos:

Qeexida 6.9: Labada sadex -xagal ee $\triangle ABC$ iyo $\triangle DEF$ way isku sargo'an yihiin waxaana loo qoraa $\triangle ABC \cong \triangle DEF$, hadii xaaladaha soo socda ay qancinayaan:

- | | | | |
|---|-------------------------------------|---|-------------------------------|
| 1 | $\overline{AB} \cong \overline{DE}$ | 4 | $\angle ABC \cong \angle DEF$ |
| 2 | $\overline{BC} \cong \overline{EF}$ | 5 | $\angle BCA \cong \angle EFD$ |
| 3 | $\overline{CA} \cong \overline{FD}$ | 6 | $\angle CAB \cong \angle FDE$ |



Jaantuska 6.39

- Xusuus: 1** Nidaamka calaamadaha $\triangle ABC \equiv \triangle DEF$ oo keliya inooma sheegayaan inay 2 saddex - xagal isku sargoan yihiin. Waxay sidoo kale inoo sheegayaan habaynta ku tirsanyaasha 2 da sadaxagal ee isku sar-go'an.
- 2** Jaantusyada isku sar go'an ku calaamadii si isku mid ah ku tirsanyaasha gudboon si ay kuu tusto gudboonaanta (isku beegnaanta) ka dhaxaysa labo sadex -xagal.

Tusaale 2: Haddii $\triangle PQR \equiv \triangle RST$ Tax dhinacyada xaglaha isu sargo'an

Furfuris: $\overline{PQ} \equiv \overline{RS}$ $\angle PQR \equiv \angle RST$
 $\overline{QR} \equiv \overline{ST}$ $\angle QRP \equiv \angle STR$
 $\overline{RP} \equiv \overline{TR}$ $\angle RPQ \equiv \angle TRS$.

Tusaale 3: Haddii $\triangle ABC \equiv \triangle DEF$ iyo $AB = 2BC$ kolkaa side bay u xiriirayaan DE iyo EF?

Furfuris: Markii $\triangle ABC \equiv \triangle DEF$

Kolkaa $AB = DE$ iyo $BC = EF$

Sidaa awgeed $AB = 2BC$ oo u dhiganta $DE = 2EF$

Koox – hawleedka 6.2

- 1** Gooso warqad cad ku sawir saddex-xagalo, saddex-xagal kasta kaga minguuri warqada khafiifka ah ee la dul dhigo sawirada si qumman oo salaxan ugu dul qabo saddex-xagalka asalka ah. Imisa hab ayuu saddex – xagalku ugu sar go'naan karaa laftigiisu?
- 2** Gooso warqad cad kuna sawir sadex-xagal siman oo aad ku soo min guurisay warqada khafiifka ah. Imisa hab ayuu sadexxagalku ugu sar-gonaan doonaa laftigiisa?

6.3.2 Tijaabooyinka Isku Sar -go'naanshaha Sadde-Xagallada

Qeexitaankii iku sar go'naanta saddex-Xagallada, waxaad ku soo aragteen inay laba saddex-xagal oo isku sar go'ani ay leeyihiin ku tirsanyaashooda gudboon ee isku sar go'an. Haddii aad haysato si aad u tilmanto laba sadde- xagal oo isku sar go'an, Ma ku cadayn ama xaqiijin doontaa dhamaan Lix-xaaladood? Waxaa jira tijaabooyin kafaalo qaadaya isku sar 'go'naanta laba sadde- xagal xataa ku hubin la'aanta lixda xaaladood. Qaar ka mid ah waxan lagu cadeeyay hoos.

B. Tijaabada dhinac-xagal-dhinac ee saddex -xagal isku sargoan**Hawlgalka 6.7**

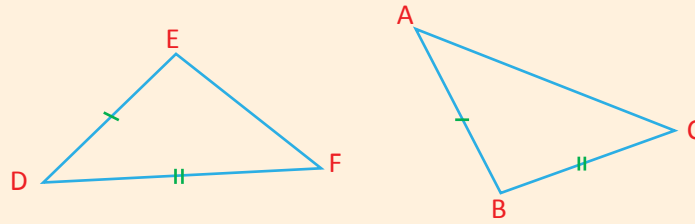
- 1
 - b Adiga oo isticmaalaya Mastarad iyo qalabka xaglo – beega ah ku sawir buuggaaga cashar qorista $\triangle ABC$ kaasoo leh labada dhinac ee \overline{AB} iyo \overline{BC} iyo Xagasha ku jirta ee u dhaxaysa labadaan dhinac ee $\angle B$ oo ah 90° iyo dhinacyada 3cm iyo 4cm.
 - t Sawir xariijinta DE ee dhererkeedu le'eg yahay dhererka \overline{BC} .
 - j Calaamadee xagasha barta D ee cabbirkeedu la mid yahay cabbirka $\angle B$.
 - x u adeegso D hal bar dhamaad oo xariijin ah, calaamadee \overline{DF} taas oo dhererkeedu la mid yahay \overline{BA} .
 - kh Dhamaystir $\triangle FDE$ kuna qabo barta F iyo E.
 - d U adeegso Mastarad kadibna Cabbir dhererka \overline{FE} is barbardhigna \overline{AC} .
 - r Ku cabbir xagal beeg $\angle E$ isbarbardhigna $\angle C$. Miyay isku sar go'an yihiin?
 - s Cabbir $\angle F$ oo is barbardhig cabbirka $\angle A$ Miyey isku sar go'an yihiin?
- 2 Adiga oo tixraacaya su'aasha 1 miyey isku sar go'an yihiin $\triangle ABC$ iyo $\triangle FDE$? Kani had iyo jeer Ma runbaa? Qaado saddex-xagallo badan inta aadkartid tijaabina.

Tijaabada dhinac – xagal – dhinac oo isku sar go'an

Laba saddex - xagal way isku sar go, an yihiin hadii ay jiraan isku beegnaan (gudboonaan) ka dhaxaysa geesaha kaas oo labada dlinac iyo xagasha ku jirta ee ugu horaysa ay isku sar go'an yihiin. Say u kala horeeyaan, qaybahan isku began ee saddex - xagalka labaaad.

Xusuus: Tijaabads sare waxaa lagu sharxi karaa soo gaabintan tijaabada Dhxdh.(SAS)

Tusaale 4: Jaantuska 6.40 fiiri $\triangle ABC$ iyo $\triangle DEF$, haddii



Jaantuska 6.40

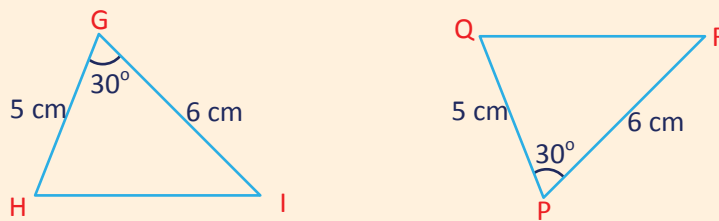
$\triangle DEF$, haddii

$$\overline{AB} \cong \overline{DE} \text{ iyo } \overline{BC} \cong \overline{EF}$$

Keebaa ay tahay inuu cadeeyo isku sargo'naanta xaglahs si ay $\triangle ABC \cong \triangle DEF$ ee tijaabadii DhxDh? (SAS)

Furfuris: Haddii $\triangle ABC$ ay ku sargoan yihiin $\triangle DEF$ ee tijaabadii DhxDh, si cad ayay $\angle B \cong \angle E$; Markaa labadaan xaglood waa kuwo ka kooban oo dhinacyo isku sargo'a ni ka dhexeeyo.

Tusaale 5: Fiiri Jaantuska 6.41, Cadee in $\triangle GHI \cong \triangle PQR$. Dhinacee ku sargo'an \overline{HI} ?



Jaantuska 6.41

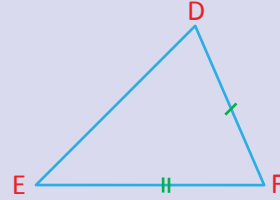
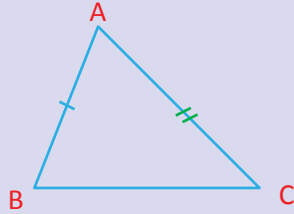
Cadayn:

- 1 $\overline{GH} \cong \overline{PQ}$ Siin
- 2 $\angle G \cong \angle P$ Siin
- 3 $\overline{GI} \cong \overline{PR}$ Siin
- 4 $\triangle GHI \cong \triangle PQR$ tijaabada DhxDh (SAS)
- 5 $\overline{HI} \cong \overline{QR}$

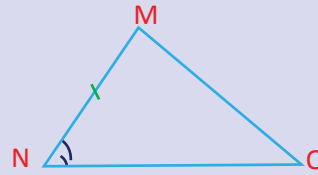
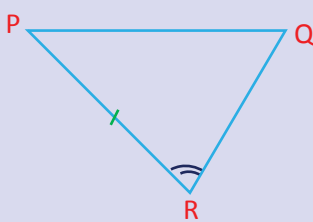
Laylis 6.6

- 1 Mid kasta oo ka mid ah kuwan soo socda, Magacaw qaybaha inay yihiin kuwo isku sar go'an si ay saddex-xagalladu u noqdaan kuwo isugu sargo'an tijaabadii DhxDh.(SA)

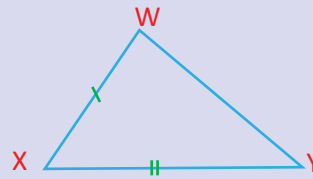
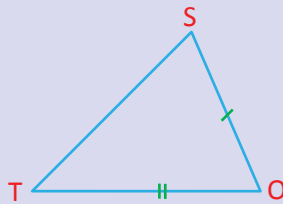
b



t

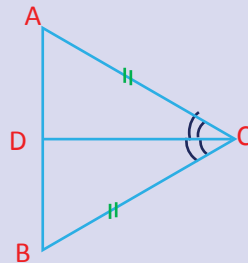


j



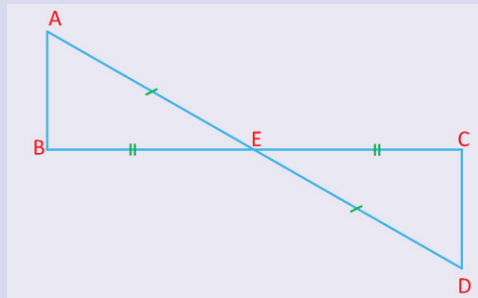
Jaantuska 6.42

- 2 Fiiri Jaantuska 6.43 haddii $\overline{AC} \cong \overline{BC}$ iyo $\angle ACD \cong \angle BCD$, Cadee inay $\triangle ACD \cong \triangle BCD$



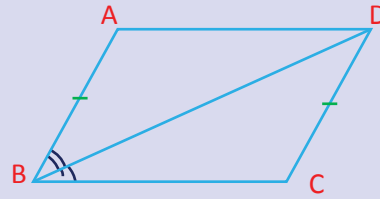
Jaantuska 6.43

- 3 Fiiri Jaantuska 6.44 Cadee in $\triangle AEB \cong \triangle DEC$



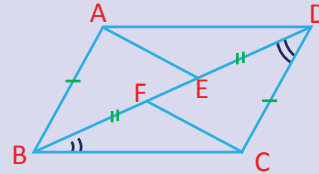
Jaantuska 6.44

- 4 Fiiri Jaantuska 6.45 Cadee in $\triangle ABD \cong \triangle CDB$.



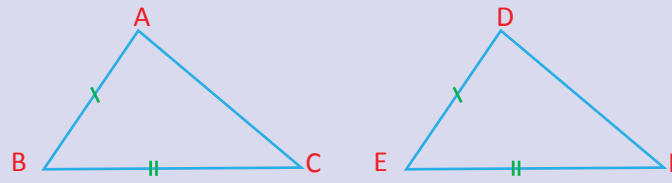
Jaantuska 6.45

- 5 Fiiri Jaantuska 6.46 hadii $\overline{AB} \cong \overline{CD}$, $\overline{BE} \cong \overline{DF}$ iyo $\angle ABE \cong \angle CDF$ Cadee in $\triangle AEB \cong \triangle CFD$?



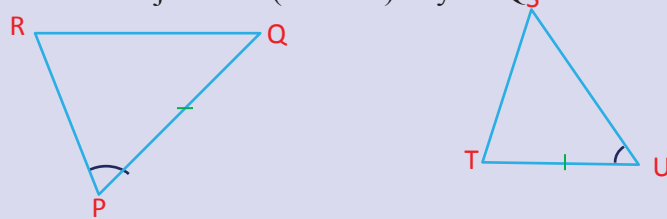
Jaantuska 6.46

- 6 Fiiri Jaantuska 6.47 hadii $\overline{AB} \cong \overline{DE}$ iyo $\overline{BC} \cong \overline{EF}$ xaglahee baa inay ku sar go'naadaan ay tahay si ay $\triangle ABC \cong \triangle DEF$ tijaabadii DhxDh? (SAS)



Jaantuska 6.47

- 7 Fiiri Jaantuska 6.48 hadii $(\overline{PQ}) \cong (\overline{TU})$, $\angle QPR \cong \angle TUS$, dhinacyadee bay tahay inay isku sar go'naadaan tijaabadii (DhxDh.) Siay $\triangle PQR \cong \triangle TUS$? (SAS)



Jaantuska 6.48

T. Tijaabada Dhinac-Dhinac-Dhinac (Dh.Dh.Dh)

Fiiri (B) Waxaynu ku soo aragnay sida loo tijaabiyo isku sar go'naanshaha saddex - xagallada iyadoo la adeegsanayo tijaabada dhinac – xagal – dhinac – Bal aynu fiirino sida isku sar go'naan -shaha loogu tijaabin karo saddex – xagallada iyada oo la adeegsanayo Dhinac – Dhinac – Dhinac. (Dh.Dh.Dh)

Koox – hawleedka 6.3

- 1 Adeegso lammaanaha xagal – beeg iyo Mastarad, dhis sadex – xagal ka ABC markii $AB = 6\text{cm}$, $BC = 7\text{cm}$ iyo $CA = 8\text{cm}$.
- 2
 - b Sawir xariijinta DE oo dhererkeedu = 6cm.
 - t U adeegso D bar dhamaadka jara goobo – badheed gacankeedu le’eg yahay BC.
 - j U adeegso E bar dhamaadka jara goobo – badheed gacankeedu le’eg yahay CA si ay isagagooyaan goobo – badheedka barta (t) bal labada goobo – badheed ha iska gooyaan F.
 - x Dhamaystir $\triangle DEF$ adiga oo sawiraya xariijinta isku xidha baraha F ilaa D iyo E.
- 3
 - b U adeegso qalabka xaglaha lagu cabiro $\triangle ABC$ iyo $\triangle DEF$.
 - t Is barbardhig $\angle A$ iyo $\angle D$; $\angle B$ iyo $\angle E$, $\angle C$ iyo $\angle F$ Xaglahan lammaani miyey isku sargo’an yihiin?
- 4 Waa maxay dhiraandhirinta ka dhaxaysa ee aad ku samaysay $\triangle ABC$ iyo $\triangle DEF$? Miyey isku sar go’an yiliin?

Koox – howleedkan sare iyo u kuurgelidii aad siiseen tijaabadii cusbayd ee isku sar go’naanta sadex-xagallada ee loo yaqaano tijaabada dhinac -dhinac – dhinac ee isku sargo’an.

Tijaabada dhinac-dhinac-dhinac ee isku sargo’naanta

Laba saddex-xagal way isku sar go’an yihiin hadii ay

Jiraan isku beegnaan ka dhaxaysa geesaha kaas

Oo 3 da dhinac ee hal saddex-xagal ay isku

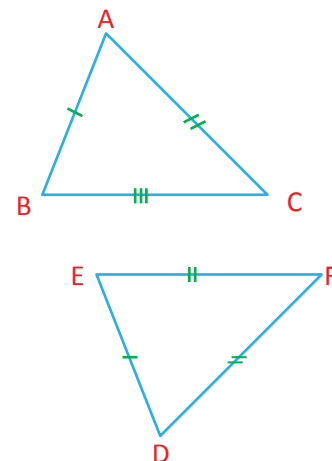
sar go’an yihiin, say u kala horeeyaan. Si ay

ugu beegnaadaan qaybaha saddex – xagalka labaad.

Soo gaabin, labada sadax-xagal ee ABC

iyo DEF, Haddii $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, iyo $\overline{CA} \cong \overline{FD}$

kolkaa $\triangle ABC \cong \triangle DEF$.

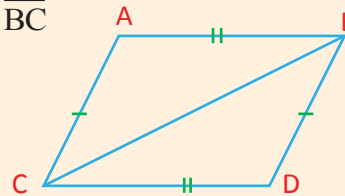


Jaantuska 6.49

Xusuus: Tijaabada sare ee isku sargo'naansh aha saddex-xagaldada waa mid ku tusinaya DhDhDh. (SSS)

Tusaale 6: Fiiri Jaantuska 6.50 $\overline{AB} \equiv \overline{DC}$ iyo $\overline{AD} \equiv \overline{BC}$

Cadee in $\triangle ADB \equiv \triangle CBD$
 kadibna $\angle A \equiv \angle C$



Jaantuska 6.50

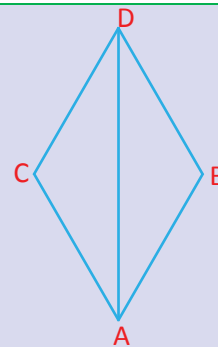
Cadayn: **Sababta**

- 1 $\overline{AB} \equiv \overline{CD}$ Siin
- 2 $\overline{AC} \equiv \overline{BD}$ Siin
- 3 $\overline{BC} \equiv \overline{BC}$ Dhinac Wadaag
- 4 $\triangle ACB \equiv \triangle CBD$ Talaabooyinka 1, 2, 3 iyo Dh. Dh. Dh
- 5 $\angle A \equiv \angle D$ qeexida sadex – xagalada isku sar go'an iyotalaabada **4aad** irra.

Laylis 6.7

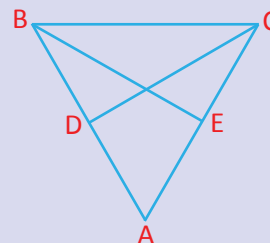
1 Fiiri jaantuskatu 6.51 $\overline{AB} \equiv \overline{AC}$ iyo $\overline{DB} \equiv \overline{DC}$

Raadi cabirka $\angle CDA$ haddii cabbirka $\angle BDA$ tahay 30° ?



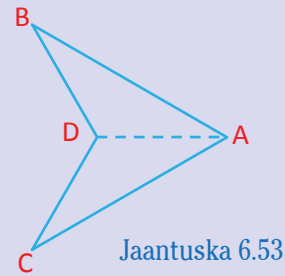
Jaantuska 6.51

2 Fiiri Jaantuska 6.52 $DB = 5\text{cm} = EC$ iyo $DC = 10\text{cm} = BE$. Haddii $m(\angle BDC) = 50^\circ$ raadi cabirka $\angle BEC$?



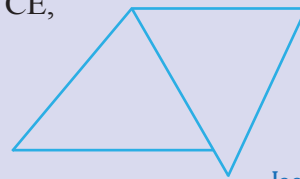
Jaantuska 6.52

- 3 Fiiri Jaantuska 6.53 $\overline{AB} \cong \overline{AC}$ iyo $\overline{DB} \cong \overline{DC}$
cadee in $\angle ADB \cong \angle ADC$



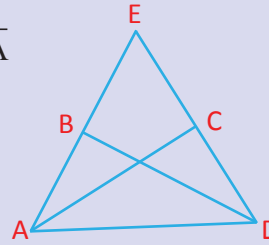
Jaantuska 6.53

- 4 Fiiri Jaantuskatus 6.54 $\overline{AC} \cong \overline{ED}$ iyo $\overline{BC} \cong \overline{CE}$,
hadii $m(\angle BCA) = 70^\circ$ Raadi cabbirka $\angle D$.



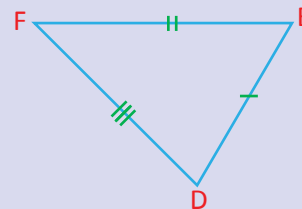
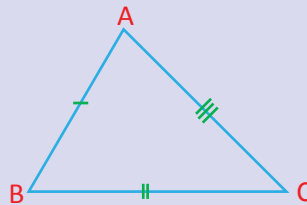
Jaantuska 6.54

- 5 Fiiri Jaantuskatus 6.55 $\overline{AB} \cong \overline{CD}$ iyo $\overline{BD} \cong \overline{CA}$
Cadee in $\triangle ABD \cong \triangle DCA$.



Jaantuska 6.55

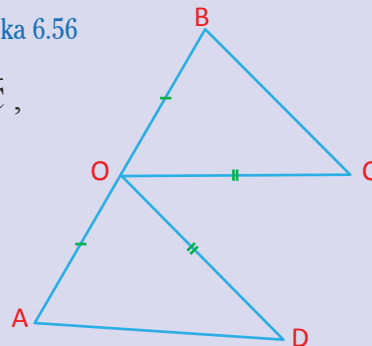
- 6 Fiiri Jaantuska 6.56 $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$ iyo $\overline{CA} \cong \overline{FD}$, hadii $\triangle ABC$ uu yahay
saddex – xagal xagal fiiqan waa maxay nooca sadex – xagalka $\triangle DEF$?



Jaantuska 6.56

- 7 Fiiri Jaantuska 6.57 $\overline{BO} \cong \overline{AO}$ iyo $\overline{OD} \cong \overline{OC}$,

$\triangle BOC \cong \triangle AOD \cong \triangle AOD$ kolkaa
DhDhDh kuwa ka soo hadhay ee
dhinacyada $\triangle BOC$ iyo $\triangle ADO$ waa
in ay isku sar go'naadaan?



Jaantuska 6.57

C Tijaabada Xagal-Dhinac-Xagal ee isku sargo'naanshaha Saddex-Xagallada:

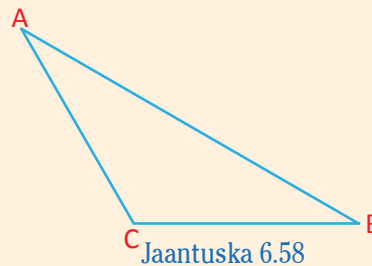
Sidii aydin ku soo aragteen tijaabooyinkii B iyo T waxay kususayeen isku sar go'naanta saddex-xa-gallada. Ka hor inta aydaan dhamaynin tijaabinta isku. Sar go'naan-shaha saddex – xagallada. Balaynu eegno tijaabada sadexaad oo loogu yeedho xagal – dhinac – xagal. (X.Dh.X)

Laakiin marka hore aynu eegno qeexida soo socota.

Qeexida 6.9: Dhinac waa midka lagu sheego inuu yahay ka ku dhex jira ama u dhexeeya laba xaglood hadii geesaha xagluhu ay sameeyaan bar-dhamaadka dhinaca.

Tusaale 7: Fiiri Jaantuska 6.58 Ma xariijinta

\overline{AC} ayaa ku dhexjirta $\angle A$ iyo $\angle C$?



Furfuris: Markii geeska A iyo C ay yihiin bar-dhamaadka \overline{AC} kolkaa \overline{AC} waxay ku dhex - jirtaa $\angle A$ iyo $\angle C$.

Hawlgalka 6.8

- 1 Adeegso xagal beeg iyo mastarad dhis $\triangle ABC$ kaa soo cabbirkiisu yahay m ($\angle A$) = 70° AB = 5cm iyo m ($\angle B$) = 60° .
- 2 **b** Sawir xariijinta DE dhererkeedu yahay 5cm.
 - t** Bar – dhamaadka D ku dhis Xagal ku sargoan $\angle A$.
 - j** Bar dhamaadka E ku dhis xagal ku sar go'an $\angle B$.
 - x** Sawir falaadh dhexmarta D iyo E calaamadee halka ay iska jaraan oo ah F.
 - kh** Cabbir dhererka \overline{AC} iyo \overline{DF} isbarbardhig. Miyey isku sargo'an yihiin?
 - d** Cabbir dhererka \overline{BC} iyo \overline{EF} isbarbar dhigna. Miyay isku sar go'an yihiin?
 - r** Cabbir Xaglaha C iyo F isbarbar dhigna. Miyey isku sargo'an yihiin?
- 3 Miyey isku sar go'an yihiin saddex-xagalda $\triangle ABC$ iyo $\triangle DEF$? Waayo?

Haddii aad hawlgalkan sare ka soo shaqaysay si sax ah waxaad arki doontaa in $\triangle ABC \cong \triangle DEF$ iyo kan oo ina siinaya natiijada tijaabada saddexaad ee saddex – xagalka isku sar go’an ee loo yaqaano xagal – dhinac - xagal. (ASA)

Tijaabada Xagal – dhinac – Xagal ee isku sar go’naanshaha Saddex -Xagallada

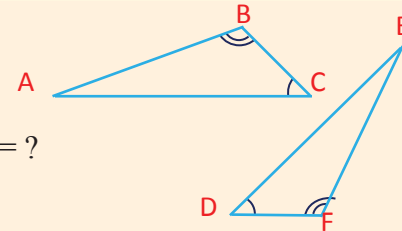
Laba saddex - xagal way isku sar go’an yihiin haddii ay jiraan isku beegnaan ka dhexaysa geesaha kuwaasoo labada Xaglood iyo dhinaca ku dhex jira hal saddex – xagal oo isku sar go’an, say u kala horeeyaan, kuwan oo ku began qaybaha saddex – xagalka labaad.

Xusuus: Tijaabada sare waxaa si gaaban loo gu sharxayaa sida tijaabada X dh X. (ASA)

Tusaale 8: Fiiri jaantuska 6.59 $\angle A \cong \angle F$

$\overline{AC} \cong \overline{FD}$ iyo $\angle C \cong \angle D$. haddii

$m(\angle B) = 20^\circ$, waa Imisa $m(\angle E) = ?$



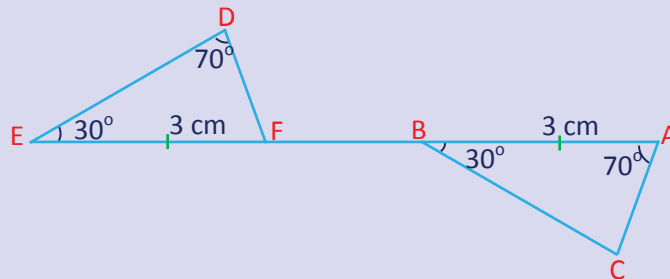
Jaantuska 6.59

Furfuris: Markii $\angle A \cong \angle F$, $\overline{AC} \cong \overline{FD}$ iyo $\angle C \cong \angle D$ kolkaa $\triangle ABC \cong \triangle FED$ ee tijaabada X DH X. (ASA) S/awgeed $\angle B \cong \angle E$ Qeexida sidaas darteed $m(\angle E) = 20^\circ$.

$$\therefore m(\angle E) = 20^\circ$$

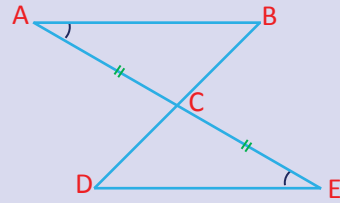
Laylis 6.8

1 Fiiri jaantuska 6.61 cadee $\triangle DEF \cong \triangle CAB$.



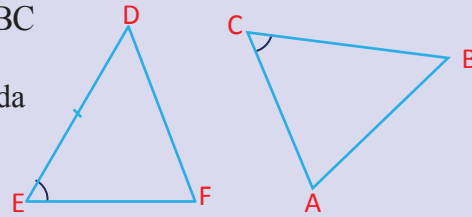
Jaantuska 6.61

2 Fiiri jaantuska 6.62 $\triangle ABC \cong \triangle EDC$? faahfaahi



Jaantuska 6.62

3 Fiiri jaantuska 6.63 $\angle E \cong \angle C$ iyo $\overline{DE} \cong \overline{BC}$ Xaglaheebaa ay tahay inay ku sar go'naadaan $\triangle ABC \cong \triangle FDE$ ee tijaabada XDHX?



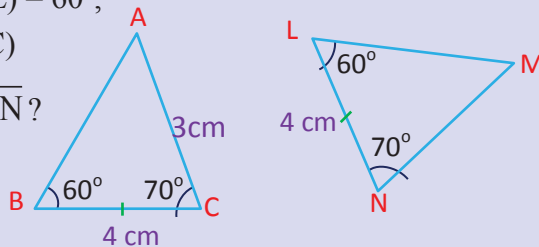
Jaantuska 6.63

4 Fiiri jaantuska 6.64 labadee baa ay tahay inay isku sargo' aan si $\triangle GHE \cong \triangle KLM$ ee tijaabada XDHX?



Jaantuska 6.64

5 Fiiri jaantuska 6.65, $m(\angle B) = m(\angle L) = 60^\circ$, $s(\overline{BC}) = s(\overline{NL}) = 4\text{cm}$, iyo $m(\angle C)$ $m(\angle N) = 70^\circ$, raadi dhererka \overline{MN} ?



Jaantuska 6.65

6.4 CABBIRAADA

Casharkan waxaad ku baran doontaan sida loo xisaabiyo ama looga shaqeeyo bedka xaglaha qumman ee saddex xagalada oo ku sallaysan qaaciidada bedka ee laydiga. Halbeegyada bedka sida loogu badelo hal qaab, qaabab kale iyo sida looga shaqeeyo wareega saddex xagallada. Waxaad sidoo kale ku arki doontaan

qaaciidada mugga Biriisim leydiyeed iyo halbeeg bedelka mugga loogu bedelayo hal qaab qaababkale.

6.4.1 Bedka Xaglaha Qumman ee Sadde Xagalka iyo Wareega Sadde-xagalada

Maxasuusan tihiin qeexida iyo qaaciidada bedka leydi? Qaaciidada ku salaysan bedka leydi. Waxa aad ka soo dhiraandhirin doontaan qaaciidada bedka xaglaha qumman ee saddex xagalada.

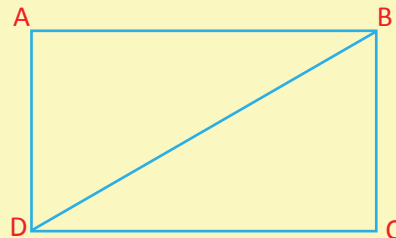
Hawl galka 6.9

- 1 **b** waa noocma Afar- geeslaha leydiga ahi?
t Waa imisa cabbirka xagal kasta ee laydi?
- 2 Tixgeli leydi dhererkiisu yahay 3cm iyo ballaciisa oo dhan 4cm. markaa:
b imisa senti mitir laba jibbaaran ayaad u qaybin kartaa leydiga?
t Maxaad ugu yeedhaa tiraada sentimitirka laba jibbaaran ee aad uqaybisay leydiga?
- 3 Tixgeli leydiga dharekiisu yahay “ ℓ ” halbeeg iyo ballaca “ w ” halbeeg Halkaasoo ℓ iyo w ay yihiin tirooyinka idil.
b imisa halbeeg laba jibbaaran ayaad u qaybin kartaa leydiga?
t Maxaad ugu yeedhaa tirade halbeega laba jibbaaran ee aad u qeybisay leydiga?

Xusuusnow:

- 1 Kani waa afar geesle afar dhinac leh, dhinacyada iska soo horjeedaa ay isku sargo’an yihiin, xaglihiisuna waa xaglo qumman. Bedka leydi (A) waa dhererka (ℓ) iyo ballaca (w) lagu siiyay tarantooda. Sida:

$$A = \ell \times w \text{ halbeeg laba jibbaaran.}$$

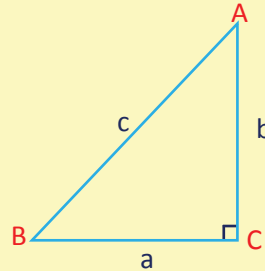


Jaantuska 6.66

2 Leydiga dhexdiisa xariijinta isku xirta geesaha iska soo horjeeda ayaa loo yaqaanaa xaglo gooye. Fiiri jaantuska \overline{BD} waa xaglo - gooye.

Bedka (A) saddex - xagal xagal qumman leh waa ka leh dhererka labada addimood (dhinacyada ka gaaban) waa a and b sida ay u kala horeeyaan waa:

$$A = \frac{1}{2} \times a \times b \text{ halbeeg laba-jibbaaran}$$



Jaantuska 6.67

Tusaale 1: Ka shaqee bedka saddex-xagal xagal-qumman leh, hadii dhererka iyo ballaca saddex xagalku yihiin 6cm iyo 8cm, sida ay u kala horeeyaan.

Furfuris: Siin $\ell = 6\text{cm}$, $w = 8\text{cm}$

$$\text{Sida loo helo bedka (A) saddex-xagal } A = \frac{1}{2} \times \ell \times w$$

$$\begin{aligned} &= \frac{1}{2} \times 6\text{cm} \times 8\text{cm} = \frac{48}{2} \text{cm}^2 \\ &= 24 \text{ sentimitir labajibaaran} \end{aligned}$$

Tusaale 2: Dhul-beereed leh qaab sadex-xagal xagal quman hadii dhererka iyo ballaca dhulku kala yahay 5m iyo 12m, say u kala horeeyaan, waa imisa goobtaas ku dhexoodan sadexagalku?

Furfuris: Siin $\ell = 5\text{m}$, $w = 12\text{m}$ sida lagu helo bedka waa

$$A = \frac{1}{2} \times \ell \times w = \frac{1}{2} \times 5 \times 12 = 30 \text{ m}^2 \text{ (mitir labajibaar).}$$

S/darted, meesha dhulka ah ee oodani waa 30 mitir oo laba jibaaran. Jaantuskatusyada bedka eekala duwan waxaa lagu cabbiraa halbeegyo kala duwan. Halbeegyada caanka ah ee bedka waxaa ka mid ah: Sentimitir laba jibbaaran & mitir labajibaaran Bal aynu eegno sida midba midka kale loogu bedelo.

1 Tixgeli bedka 1 mitir oo labajibaaran.

$$1 \text{ mitir labajibaar} = 1 \text{ mitir} \times 1 \text{ mitir}$$

$$= 100 \text{ sentimitir} \times 100 \text{ sentimitir}$$

$$= 10,000 \text{ sentimitir labajibaaran}$$

S/darted, 1 mitirlaba jib = 10,000 sentimitir la ba jib.

2 Tixgeli bedka 1 sentimitir laba jibaran.

$$\begin{aligned} 1\text{sentimitir labajibaar} &= 1\text{sentimitir} \times 1\text{sentimitir} \\ &= \frac{1}{100}\text{mitir} \times \frac{1}{100}\text{mitir} \left(\frac{1}{100}\text{mitir laba jibaar} \right) \\ &= 0.0001\text{mitir laba jibaar} \end{aligned}$$

S/awgeed.

$$1\text{ senti mitir laba jibaaran} = 0.0001 \text{ mitir laba jibaaran}$$

3 Halbeega sadexaad ee bedku waa hektarka. Waxaad adeegsataan marka aad cabbiraysaan bedka dhulka.

$$1\text{hektar} = 10,000\text{mitir laba jibaaran}$$

Sidaa darted markii aad hektarka u badalaysaan mitir labajibaaran waxaad ku dhufanaysaan 10,000 markii aad u bedalaysaan mitir labajibaaran hiktarka waxaad u qaybisaan 10000.

Tusaale 3: U bedel 7 mitir oo labajibaaran sentimitir labajibaaran.

Furfuris: $1\text{m}^2 = 10\,000\text{cm}^2$.

$$7\text{m}^2 = 7 \times 10,000\text{cm}^2 = 70\,000\text{cm}^2$$

Tusaale 4: $860\,000\text{cm}^2$ u bedel m^2 .

$$\begin{aligned} \text{Furfuris: Markii } 10000\text{cm}^2 &= 1\text{m}^2, \quad 860\,000\text{cm}^2 = \frac{860,000}{10,000}\text{m}^2 \\ &= 86\text{m}^2 \end{aligned}$$

Tusaale 5: 5 hektar u bedel m^2 iyo cm^2 .

Furfuris: $1\text{hektar} = 10,000\text{m}^2$

$$= (10,000 \times 10,000)\text{cm}^2$$

$$= 100,000,000\text{cm}^2.$$

$$\text{Kolkaa 5 heektarka} = 5 \times 10,000\text{m}^2$$

$$= 5 \times 100,000,000\text{cm}^2$$

$$= 500,000,000\text{cm}^2$$

$$= 50,000\text{m}^2$$

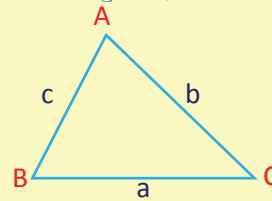
Tusaale 6: $680,000\text{m}^2$ u bedel hektar.

Furfuris: Markii $10,000\text{m}^2 = 1$ hektar

$$680,000\text{m}^2 = \frac{680,000}{10,000} = 68 \text{ hektar}$$

Fasalkii 5^{aad} waxaad ku soo barateen sida loo xisaabiyo ama looga shaqeeyo wareega saddex - xagalka.

Xusuus: Wareega saddex-xagal waa fogaanta ku wareegsan sadex-xagalka. Hadii, a, b iyo c' ay yihiin dhererka dhinacyada saddex-xagalka, kolkaa wareega saddex xagalku waa, $(a+b+c)$ oo halbeeg.



Jaantuska 6.68

Tusaale 7: Ka shaqee wareeg sadex-xagal dhinacydiisu kala yihiin 8cm, 9cm iyo 13cm.

Furmaata: Wareega s/xagal = wadarta dhererka dhinacyada.

$$= 8\text{cm} + 9\text{cm} + 13\text{cm} = 30\text{cm}$$

Tusaale 8: Raadi dhererka dhinaca sadexaad ee sadex-xagal labadiisa dhinac ee kale yihiin 6cm iyo 10cm iyo wareegiisa oo ah 29cm.

Turfuris: Bal dhererka dhinaca sadexaad aan u qaadano x, kadibna.

$$\text{Wareegu} = 6\text{cm} + 10\text{cm} + x\text{cm}$$

$$29\text{cm} = 16\text{cm} + x\text{cm}$$

$$x = 29\text{cm} - 16\text{cm}$$

$$x = 13\text{cm}$$

S/awgeed dhinaca 3aad dhererkiisu waa 13 cm.

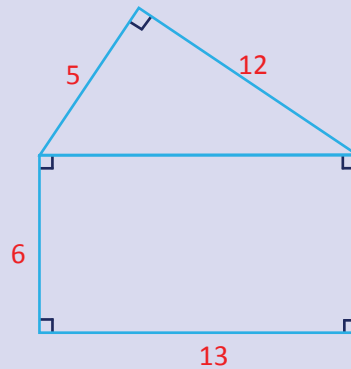
Laylis 6.9

- 1 Raadi bedka sadexagal xagal quman, kaasoo labadadhinac ee gaabani dhererkoodu kala yahay 6cm iyo 8cm?
- 2 Hal addin (lug) iyo bedka sadexagal xagal qumman ayaa kala ah 8cm iyo 24cm^2 , say u kala horeeyaan, raadi dhererka lugta (adinka)?

- 3 Haddii a iyo b ay yihiin dhererka lugaha (adimada) sadexagal iyo A oo ah badkiisa kadib ku minguuri oo dhamaystir tusahan soo socda ee hoose buuggaga cashar qorista.

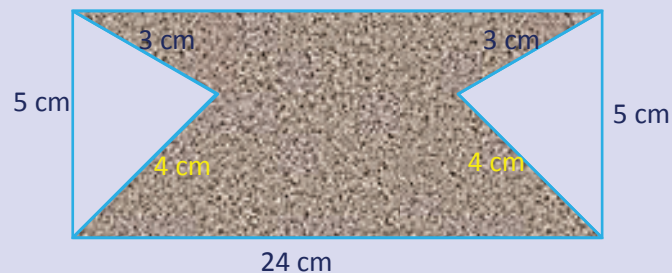
| b | t | A |
|-----|-----|-----|
| 3 | | 6 |
| 6 | 8 | |
| | 24 | 216 |

- 4 Fiiri jaantuskataska: 6.68, Raadi bedka.



Jaantuska 6.69

- 5 U bedel kuwan soo socda m^2 .
b $50,000cm^2$ **t** $1000cm^2$ **j** 6 heekta.
- 6 U bedel kuwan soo socda cm^2 .
b $8m^2$ **t** $0.6m^2$ **j** 3 heekta.
- 7 U bedel hektaro.
b $60,000m^2$ **t** $400,000,000sm^2$ **j** $120m^2$
- 8 Jaantuskataska 6.70 ka shaqee wareega iyo bedka qaybta hadhaysan.



Jaantuska 6.70

- 9 Ka shaqee wareega sadexagalka kaasoo dhererka 3 dhinac wata.
b 8sm, 11sm, iyo 13sm **t** 21sm, 11sm, iyo 25sm
j 9sm, 12sm, iyo 15sm

- 10** Dhererka labada dhinac ee sadex – xagal lagu siiyay ayaa kala ah 5cm iyo 14cm hadii uu wareega saddex-xagalku yahay 26sm soo saar lugta 3^{aad}.
- 11** Sadexagal xagal quman leh 3 diisa dhinac dhereradooduna kala yihiin 6sm, 8sm iyo 10sm.
- b** soo saar wareega sadex xagal.
- t** soo saar bedka sadex-xagalka.

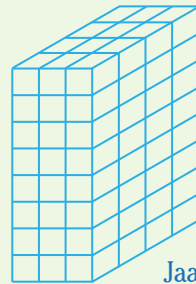
6.4.2 Mugga Biriisam Laydiyeed

Sida ugu badan ee caadiga ah markii loo fiirsado Biriisamku waa sanduuq maadaama salkiisu yahay leydi, geesaha dhinacyadiisuna ay yihiin kuwo ku qotoma salka, waxaana la odhan karaa biriisam leydiyeedku waa adke kasta oo meel oodan ah, meeshaas oodan (xiran) ee biriisamka ayaa la yidhaahdaa mugga biriisamka.

Waad qiyaasi kartaa mugga biriisam leydiyeed buuxinaya ee wata halbeega saddex jibaaran. Taas oo ah tirada halbeega saddex-jibaaran ee buuxiya biriisam leydiyeedku inuu yahay mugga biriisam leydiyeedka

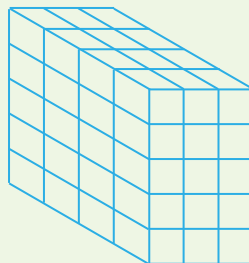
Hawlgalka 6.10

- 1** Imisa halbeeg saddex jibaaran ayaan ku buuxin karnaa biriisam leydiyeed
- b** dherer = 3cm balla C = 4cm iyo jog = 8cm?



Jaantuska 6.71

- t** dhare = 3cm, ballac = 4cm iyo jooga = 5cm?



Jaantuska: 6.72

- 2** Imisa halbeeg oo saddex jibaaran baan ku buuxin karnaa biriisam leydiyeed cabbirada dhinacyadiisu kala yihiin “ ℓ ” halbeeg, “ w ” halbeeg iyo “ h ” halbeeg? Maxaad ugu yeedhi (odhani) tirada halbeega sadex jibaaran ee aad ku buuxisay biriisamka?

Hawlgalkan sare, waxaad ku arki kartaa in: Mugga biriisam leydiyeed cabbirada dhinacyadiisu kala yihiin ℓ = dhererka, w = balaca iyo h = joogga waa:

$$V = \ell \times w \times h \text{ oo halbeegyo saddex - jibbaaran}$$

Tusaale 1: Soo saar muga biriisam leydiyeed dhererkiisa, ballaciisa iyo joogiisuba kala yihiin 8cm, 6cm iyo 10cm, say u kala horeeyaan.

Furfuris: Muga biriisamka = $\ell \times w \times h$

$$= 8\text{cm} \times 6\text{cm} \times 10\text{cm}$$

$$= 480\text{cm}^3$$

Tusaale 2: Muga biriisam leydiyeed lagu siiyay oo ah 270 Halbeeg 3 jibaar. Hadii dhererka iyo ballaca Biriisamku kala yihiin 6 halbeeg iyo 9 halbeeg, say u kala horeeyaan, soo saar joogga biriisamka.

Furfuris: Mugga = $\ell \times w \times h$

$$= 6 \times 9 \times h$$

$$270 = 54h$$

$$h = \frac{270}{54} = 5 \text{ halbeeg}$$

Mugga adkayaasha waxaa lagu sharxaa adeegsiga halbeegyada kala duwan ee cabbiraada. Tusaale: sentimitiro sadex – jibaaran (cm^3), Mitiro sadex – jibaaran (m^3), litir, mililitiro oo ah halbeegyada muga qaar ka mid ah, ee aad ku arki doontaan sida la isugu bedelo hal halbeeg oo mug ah mid kale.

1 $1\text{m}^3 = 1\text{m} \times 1\text{m} \times 1\text{m}$

$$= 100\text{cm} \times 100\text{cm} \times 100\text{cm}$$

$$= 1,000,000\text{cm}^3$$

Sidaa awgeed, $1\text{m}^3 = 1,000,000\text{cm}^3$

$$1\text{m}^3 = 1,000,000\text{cm}^3$$

$$2 \quad 1\text{cm}^3 = 1\text{cm} \times 1\text{cm} \times 1\text{cm}$$

$$= \frac{1}{100}\text{m} \times \frac{1}{100}\text{m} \times \frac{1}{100}\text{m}$$

$$= \frac{1}{1,000,000}\text{m}^3 = 0.000001\text{m}^3$$

$$\text{S/awgeed, } 1\text{cm}^3 = 0.000001\text{m}^3$$

$$3 \quad 1 \text{ litir} = 1000 \text{ militir} = 1000\text{cm}^3$$

Tusaale 3: u bedel 5 litir mililitir.

Furfuris: 1litir = 1000 mililitir

$$5\text{litir} = 5 \times 1000 \text{ mililitir}$$

$$= 5000 \text{ mililitir}$$

Waxaynu usoo gaabin karnaa mililitirka ml

Sidaa awgeed 5litir waa 5000ml.

Tusaale 4: U bedel 6000,000 cm³ litriro, iyo mitiro.

Furfuris: 1000cm³ = 1litira

$$\text{S/awgeed } 6,000,000 \text{ cm}^3 = \frac{6,000,000}{1,000,000} \text{L} = 6000\text{litir}$$

$$\text{Silamida } 1000 \text{ 000cm}^3 = 1\text{m}^3$$

$$\text{S/awgeed, } 6,000,000 \text{ cm}^3 = \frac{6,000,000}{1,000,000} \text{m}^3$$

$$= 6\text{m}^3$$

$$\text{Sidaa darged, } 6,000,000\text{cm}^3 = 6000 \text{ L} = 6\text{m}^3$$

Tusaale 5: U bedel 10 mitir sadex jibbaaran, sentimitir sadex - jibbaaran.

Furfuris: 1m³ = 1,000,000cm³

$$\text{S/awgeed, } 10\text{m}^3 = 10 \times 1,000,000\text{cm}^3$$

$$10\text{m}^3 = 10,000,000\text{cm}^3$$

Laylis 6.10

- 1 waa imisa saddex-jibaaran litirada biyo aynu ka buuxin karno qaabkiisu yahay biriisam leydiyeed cabbirada dhinacyadiisu kala yihiin $10m \times 20m \times 15m$?
- 2 Mugga biriisam leydiyeed oo dhan $300cm^3$. Haddii dhererka iyo ballaca Biriisamku yihiin 10cm iyo 5cm, siday u kala horeeyaan, soo saar jooga biriisamka?
- 3 Kuwan soo socda u bedel mid kasta mitir saddex jibaaran.
 - a $3,000,000,000 \text{ sm}^3$
 - b $500,000,000 \text{ sm}^3$
 - c $92,000,000 \text{ sm}^3$
- 4 Kuwan soo socda u bedel mid kasta sentimiitiro sadex-jibaaran.
 - a $5m^3$
 - b $27m^3$
 - c $32m^2$
- 5 Kuwan soo socda u bedel mid kasta mililitiro.
 - a 62litir
 - b 5litir
 - c 96litir
- 6 kuwan so socda u bedel mid kasta sentimitir sadex-jibaran.
 - a 2litir
 - b 5mililitir
 - c 11,000,000militir
- 7 kuwan soo socda u bedel mid kasta litriro.
 - a $2,000,000sm^3$
 - b 5,000,000 ml
 - c 6 m^3
- 8 Qarruurad ay kujiraan caano ka kooban 300ml. imisa litir oo caano ah ayaa qaruurada ku jirta?
- 9 Cabbirada dhinacyada sagxada qolalka kala ah $3m \times 5m$. Haddii joogga qolku yahay, 12m, soo saar mugga hawo ee ku jirta qolka?
- 10 Salka qol afar gees (laba jibbaarane) ah oo dhiniciisu yahay 5cm. Haddii muga qolku uu yahay $200m^3$ soo saar joogga qolka.

Hubin

| | |
|--|--|
| ↳ Xaglo Deris ah | ↳ Litirka |
| ↳ Xaglo gudeed talantaali ah | ↳ Mitir saddex jibaaran |
| ↳ Qaaciidada Bedka S/xagal xagal quman | ↳ Militir |
| ↳ Senti mitir saddex-jibbaaran | ↳ Xariiqaha barbarada ah |
| ↳ Xagasha dhamaystirta | ↳ Wareega saddex-xagal |
| ↳ Xaglaha is dhamaystira | ↳ laydi |
| ↳ Saddex-xagalada isku sargo'an | ↳ Biriisam leydiyeed |
| ↳ Xaglo dibadeedyada dhinacyada iskumidka ah ee gudbana | ↳ Saddex xagal xagal quman Xagasha buuxisa |
| ↳ Xaglo gudeedyada dhinacyada isku midka ah ee gudbanaha | ↳ Xaglaha isbuuxsha Gudbane |
| ↳ Lammaaneyaasha toosan ee xaglaha derisk ah | ↳ Halbeeg saddex jibaaran |
| ↳ Xaglaha iska soo horjeeda ee taagan | |



Soo Koobida Cutubka

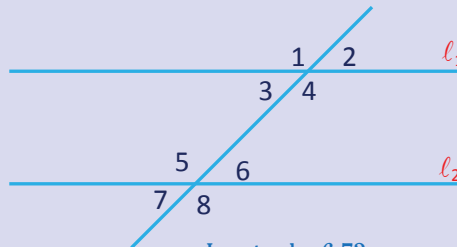
- 1 Laba xaglood oo wadaaga dhinac iyo gees ayaa loo yaqaanaa xago deris ah.
- 2 Habo xaglood oo deris ahi dhinacyada aanay wadaagin ee sameeya xariiqda toosan ayaa loo yaqaanaa hamaanaha toosan.
- 3 Xaglaha iska soo horjeeda ee taagan way is le'eg yihiin.
- 4 Labada xaglood ee wadarta cabbirkoodu yahay 90° waxaa la yidhaahdaa xaglaha is dhamaystira. Haddii labada xaglood ee x iyo y ay yihiin kuwo is dhamaystira, kolka x waa dhamaystiraha y lidkeeduna waa la mid.
- 5 Labada xaglood ee α iyo β waa xaglo is buuxiyo, hadii wadarta cabbiradoodu tahay 180° “ α ” waxaa la yiraahdaa buuxiyaha β lidkeeduna waa la mid.
- 6 Xariiqka ka gudba laba ama in ka badan oo xariiqood ayaa loo yaqaanaa gudbane.

- 7 Laba xariiqood oo toosan oo laga helo sallax isku mid ah waa bar-baro, hadii ayna is goynayn. Sikasta ha ahaatee w.
- 8 Markii laba xariiqood oo barbaro ah yihiin kuwo uu ka gudbo gudbanuhu:
- ◆ Xaglaha gudboon way isku sargo'an yihiin.
 - ◆ Xaglo gudeedka talantaaliga ahi way isku sargo'an yihiin.
 - ◆ Xaglo dibadeedka talantaaliga ahi way isku sargo'an yihiin.
 - ◆ Xaglo gudeedyada dhimacyada isku midka ah ee gudbanuhu way is buuxshaan.
- 9 Saddex-xagalkasta oo wadarta 2da dhinac ee kasta ee xaglihiisu way is le eg yihiin.
- 10 Saddex – xagalka labaalaha ah labadiisa xaglood way is leg yihiin.
- 11 Sadaxagalka siman cabirka xagal kasta waa 60° .
- 12 Hadii labada dhinac ee sadexagal yihiin kuwo aan is le ekayn xaglaha iska soo horjeeda ee dhinacyadani isma le'eka xagasha ugu waynina waa mid ka soo horjeeda dhinaca ugu dheer.
- 13 Hadii labada xaglood ee sadexagal ayna isle'ekayn, dhinacyada iska soo horjeeda ee xagalahani isma le'eka dhinaca ugu dheeri wuxuu ka soo horjeedaa xagasha ugu wayn.
- 14 Labo jaantuskatus joomatariyeed way isku sar go'an yihiin hadii ay leeyihiin qaab iyo baaxad isku mid ah.
- 15 Labo saddex-xagal way isku sargoan yihiin, hadii ay labada dhinac ee gudbooni (iskubeegani) isku sar goan yihiin xaglaha gudboonina isku sargo an yihiin.
- 16 Isku sar go'naanshaha laba sadexagal waxaa lagu mujin (tusin) karaa mid ka mid ah tijaabooyinka (SAS), (SSS), ama (ASA). Oo ku xidhan waxa ay ina siinayaan ku tirsaneyaasha sadexagalladu.
- 17 Bedka (A) sadexagal xagal quman leh oo ay dhinacyadiisu a, b, iyo c halbeeg yihiin waa ,
- $$A = \frac{1}{2} \times a \times b \text{ halbeeg. Laba jibaaran iyo wareega sadaxagal oo ah.}$$
- P = (a+b+c) halbeeg.
- 18 $1\text{m}^2 = 10,000\text{cm}^2$
- 19 $1\text{cm}^2 = 0.0001\text{m}^2$
- 20 $1 \text{ hektar} = 10,000\text{m}^2$
- 21 $1\text{m}^3 = 1,000,000\text{cm}^3$
- 22 $1\text{cm}^3 = 0.000001\text{m}^3$
- 23 $1\text{litir} = 1000\text{ml} = 1000\text{cm}^3$
- 24 $1\text{m}^3 = 1000\text{litir}$

? Layliska guud ee cutubka 6^{aad}

- 1 Soo saar jooga leydi hadii Bedka leydi yahay 32cm^2 salkiisuna yahay 16cm ?
- 2 Raadi (hel) dhamaystiraha iyo buuxiyaha xagalahan soo socda.
b 20° **t** 30° **j** 45°
- 3 Wareega sadaxagalka ah 14cm . Haddii dhinacyada saddex xagalku haystaa yihiin dherer 5cm iyo 3cm raadi dhererka dhinaca sadexaad?
- 4 Badka sadex – xagal quman leh waa 64cm^2 , haddii dhererka adin (lug) ay tahay 16cm , raadi dhererka lugta kale?
- 5 Buuxiyaha xagasha 30° wuxuu laba jeer ka badan yahay xagasha raadi xagashaa?

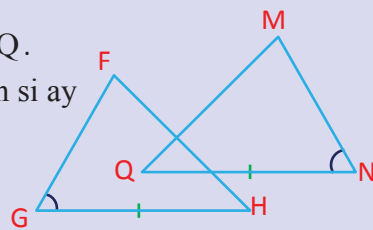
6 Jaantuska 6.73.



Jaantuska 6.73

- b** Maxaad ugu yeedhaa lamaanaha xagasha 1 iyo 5?
- t** Maxaad ugu yeedhaa lamaaneyaasha xagal aha 3 iyo 6?
- j** Maxaad ugu yeedhaa lamaanaha xagasha 1 iyo 4?
- x** Ma xaglaha 1 iyo 2 ayaa ah xaglo deris ah? Waayo?
- kh** Goormay lamaanaha xaglaha 1 iyo 5 is le'eeg yihiin?
- 7 Kee baa ururada tirooyinka soo socda noqon kara shaqada dhererka dhinacyada sadex-xagal?
b 6,7,9 **t** 6,6,12 **j** 8,8,15
- 8 Sadex-xagalka $\triangle ABC$ $s(\overline{AB}) = 6\text{cm}$, $s(\overline{BC}) = 8\text{cm}$ iyo $s(\overline{CA}) = 9\text{cm}$ waatee xagasha ugu wayni? Teebaase ugu yar?

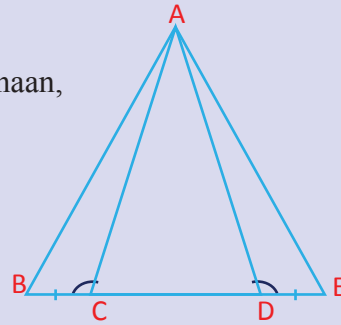
- 9 Fiiri Jaantuska: 6.74, $\overline{GH} \cong \overline{QN}$ iyo $\angle FGH \cong \angle MNQ$.
 Dhinacyadeebay tahay inay isku sar go'naadaan si ay $\triangle FGH \cong \triangle MNQ$



Jaantuska 6.74

- 10 Jaantuska 6.75, $\overline{BC} \cong \overline{DE}$ iyo $\angle ACB \cong \angle ADE$

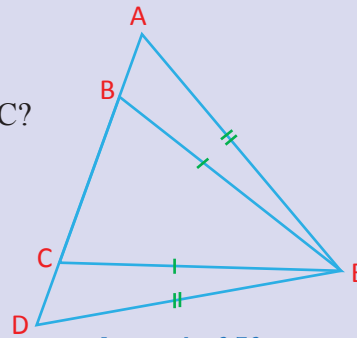
hadii $\overline{AC} \cong \overline{AD}$ miyey isku sar go'naan doonaan,
 $\triangle ACB \cong \triangle ADE$ waayo?



Jaantuska 6.75

- 11 Jaantuska 6.75, $\overline{AE} \cong \overline{DE}$, $\overline{BE} \cong \overline{CE}$

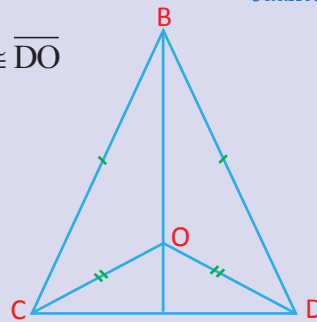
Hadii $\angle AEC \cong \angle DEB$ miyey, $\triangle AEB \cong \triangle DEC$?



Jaantuska 6.76

- 12 Jaantuska 6.77, $\overline{BC} \cong \overline{BD}$ iyo $\overline{CO} \cong \overline{DO}$

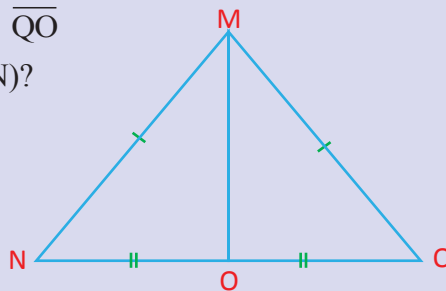
Marka tus inay $\angle CBO \cong \angle DBO$.



Jaantuska 6.77

- 13 Jaantuska 6.78, $\overline{MN} \cong \overline{MQ}$, iyo $\overline{NO} \cong \overline{QO}$

hadii $m(\angle Q) = 65^\circ$ waa imisa, $m(\angle N)$?



Jaantuska 6.78

- 14 U bedel 2000 litir mitir sadex jibaaran.
 15 U bedel 50000 cm² Mitir laba - jibaaran.