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Tilmaame Bare

Fasalka 6aad

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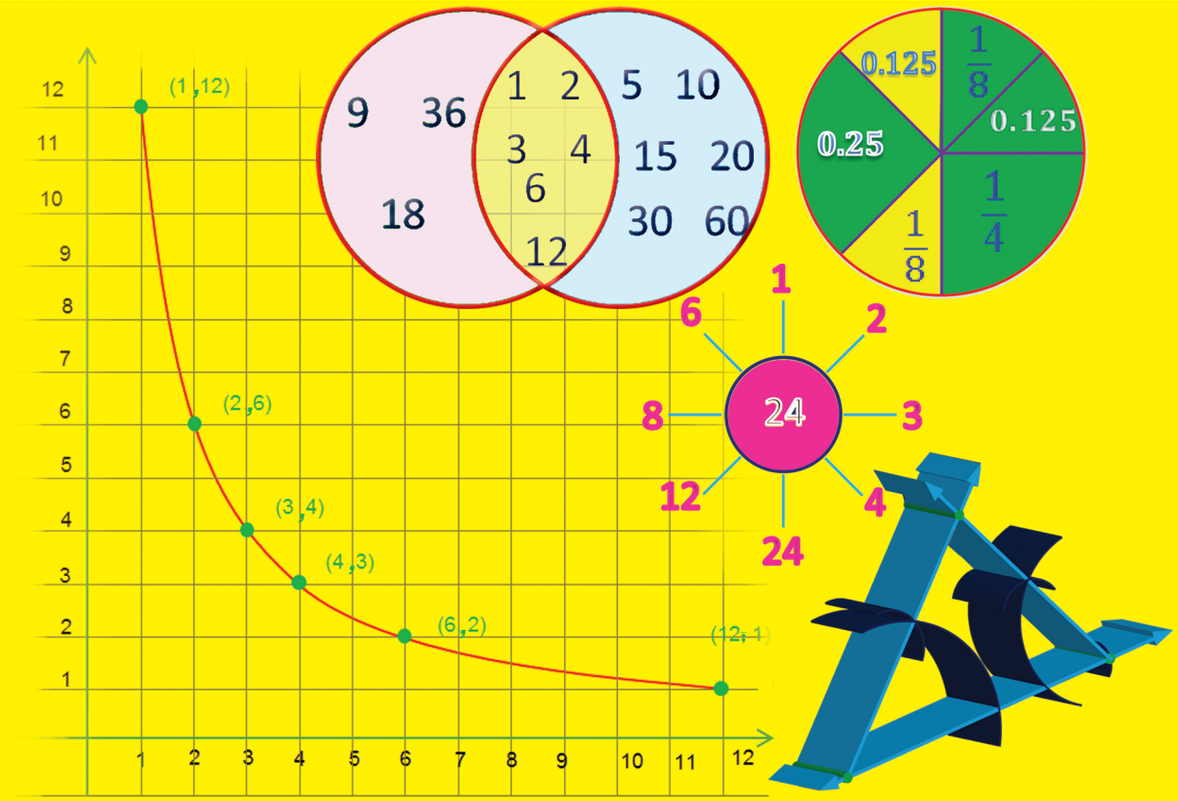

JAMHURIYADA DIMOQRAADIGA FADARAALKA ITOOBIYA
WASAARADDA WAXBARASHADA

MOE

JAMHURIYADA FADARAALKA DIMOQRAADIGA ITOOBIYA
WASAARADDA WAXBARASHADA

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XISAAB

TILMAAME BARE

FASALKA 6aad

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Cabdifatax Cumar Xuseen

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Jamal Xasan Maxamad

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TUSMADA BUUGGA

CUTTUB 1 FIKRADAHA AAS AASKA U AH URURADA

HORDHAC

Ujeedooyinka ugu waawayn ee cutubkani waa in ardayda laga dhigo kuwo yaqaana macnaha urur; noocyada xidhiidh ee ka dhexeeya ururada iyo xisaabfallada aasaasiga ah ee ururada qaar ka mid ah iyo inay awoodi doonaan inay samayn karaan xisaabfallada nooca ah iskood.

Tani waa marka koowaad ee arday fasalka lixaad ah la baro macnaha ururada. Haddaba waa in awooda la saaro in la hubiyo halka laga bilaabayo in lagu celceliyo, la xoojiyo iyo in si habaysan (nidaamsan) loo habeeyo tibxaha aasaasiga ah iyo summadaha la xidhiidha ururada.

Waxa cad in xisaabta fasalada dugsiga hoose ay ka buuxaan tirooyin, qaaciidooyin, sawiro, xeerar iyo waxyaalo kale, si kasta ha ahaatee, inagoo isticmaalayna sharaxaada iyo tusaalayaal kala duwan oo la xidhiidha ururada muuqaal ama walxo dhab ah oo laga helo deegaanka ardaydu ku nooshahay iyo sawiro ama summado, arday kasta waxaa laga caawin doonaa in uu fahmo xisaabtu inay tahay qaab gaar ah oo ka jawaab celinaya muuqaalka walax dhab ah. Habka kaabayaasha, habka qiimaynta, tusaalayaasha iyo waxyaalo kale, halka waxay ugu qoran yihiin waa qorshe kaliya ee ma aha wax kasab ah.

Talo bixinta la doorbiday waxay ina siinaysaa war kooban oo ku saabsan ujeedooyinka ciwaankan iyo inay tilmaan inaga siiso dhigista iyo habka waxbarashada. Kuwan waxaa ka mid ah dhammaan ama qayb ahaan kuwan soo socda:

- Sida heerka laga bilaabo loo hubinayo
- Sida hanuunin iyo dardargalin loo siin karo.
- Sida masalooyinka loo xallin karo
- Sida shaqada sabuurada loo qorshayn karayo
- Kalkaaliye noocma ah ayaa la diyaarin karaa si loogu taageero hab-baris barasho.

- Maxaa la qaban si laylis loo siiyo, loogu celceliyo ama loo habeeyo. Si kasta ha ahaatee, waxaa weeyi macalinka masuuliyadiisa in uu doorto qorshayaasha iyo tilmaamaha kuwaas oo u muuqda inay ku haboon yihiin gabadha ama wiilka awoodiisa iyo dabeecadiisa wax dhigideed iyo fahanka ugu fiican ee ardayga.

Ujeedooyinka waxbarasho

Dhammaadka cutubkan koowaad, ardaydu waxay awoodi doonaan in ay:

- *Caddeeyaan erayada cusub ee ururada si sax ah.*
- *Kala saaraan, hormo ururo quman, ururada isku midka ah iyo ururada isku-dhigma.*
- *Go'aanshaan dhextaalka iyo isu taga laba urur oo lagu siiyay.*
- *Sawiraan jaantuska feen si ay ugu muujiyaan dhextaalka iyo isutaga laba urur oo lagu siiyay.*

Kaabayaasha loo doorbiday Cutubka 1aad

- Muqarar, buugga ardayga iyo tilmaame bare ee xisaabta fasalka 6aad.
- Qalin qoriyo midabo kala duwan leh, (ardayda).
- Tamaashiir midabo kala duwan leh(sabuurada loo isticmaalo)
- Walxo sida furka dhalooyinka, dhagax toosh la isticmaalay, dhagax dixeed IWM, noocyo sumado ama walxo kala duwan u taagan oo laga helo deegaankooda.
- Shax (khariidad) ina tusinaysa jaantuska feen ee ururo cayiman; xidhiidhka ka dhexeeya iyo xisaab fallada aasaasiga ah ee ururada.

1.1 HORDHACA URURADA

Saacadaha loo qoondeeyay: 3 xisadood

Waxa ugu yare ee ardaydga laga rabo

Dhammaadka cuttub hoosaadkan ardaydu waxay awoodi doonaan in ay:

- *Sharxaan waxa uu yahay macnaha urur iyo ku tirsane.*

1.1.1 Qeexida Macnaha urur

Gudbinta Casharka

Intaanad siinin qeexida saxda ah ee urur waxaad isku daydaa in aad siiso tusaalayaal la mid ah kuwa ku yaala buugga ardayga, kuwaas oo ka caawin doona arday kasta in uu barto fikradaha aasaasiga ah ee urur iyo in ay eegaan xidhiidhka ka dhexeeya macna xisaabeedka urur iyo tala xidhiidha nolol maalmeedkeena maalin kasta. Waxaad ku bilaabi kartaa muuqaal duleed, kuwaas oo xidhiidh wadaaga sida qoys, urur dad ah (waalid iyo carruurtoodii) fasal “urur Arday ah” koox “urur ciyaartooy ah” IWM.

Walxaha aad isticmalayso waxaa loo baahan yahay in ay noqdaan ku ardaydu garanayaan tusaaleyaal xisaabeed oo saa,id ah sida :-

Ururka godadka, ururka tirooyinka idil, ururka tirooyinka tirsiimo, ururka shaxanada joometeriga iwm. Ayaa loo baahan yahay in la isticmaalo sidoo kale:-

Ku dhiri- gali ardayda in ay si firficoon uga qeybgalaan dooda- taasi waxay tahay in aad ardyda ku dhiirigaliso inay bixiyaan tusaaleyaal ay iyagu sameeyaan oo ku saabsan ururka si aad u eegtid inay fahmeen macnaha urur iyo xidhiidhka ka dhexeeya tusaaleyaasha duleed iyo fikrada xisaabeedka ururka (kuwaas oo ah, summada ama sawiro)

Dabadeed, ardayda u sheeg in erayga “urur” xisaab ahaan in uu yahay (sharaxo) walxo la isu ururiyey oo si fiican u qeexan (la kala sooci karo)

Jiritaankiisa, sii qeexida 1.1 ee ururka ee ku taala buugga ardayga. Ardayda waxaad ugu yeedhi (sheegi) kartaa in ay akhriyaan qeexida ku taala buugga ardayga.

Dabadeed, kuwo kale ha soo jeediyaan ama ha soo koobaan waxay soo akhiryeen,

Howlgalka 1.3 waxaa loo isticmaali karaa inay fahmaan waxaan uga jeedno si fiican u qeexan (xasuusnow in howlgalku ama shaqo fasalku ay xiiso leedahay marka ay ardaydu ka wada qeybgalaan)

Ardayda caawi si ay si fiican ugu fahmaan waxaan uga jeedo si fiican u qeexan adigoo isticmaalaya tusaaleyaal. Tusaale ahaan “ koox ardayda wiilasha quruxda badan ee dugsiga “ hagaag uma qeexna ama ma noqon karo urur waayo, ma jiro heshiis caan ah oo sheegaya waxa macnaha ardayda quruxda badani yahay.

Halka “ururka tirooyinka kisi ee tirsiimo ee ka yar 10) uu si fiican u qeexan yahay waayo in ku tirsaneyaasha ururkani yahay 1,3,5,7 iyo 9 . adigoo la xidhiidhinaya qeexida, xasuusi ardayda summada ururka ee {}. Sidoo kale xasuusi ardayga in walax kasta oo ururka ka tirsan lagu magacaabo kutirsane ama xubin , oo

summada xubinimaduna tahay , summada sheegaysa in aanu xubin ahaynina tahay, adigoo isticmaalaya tusaaleyaal, tus ardayda siday u isticmaali la haayeen summadahan sida ugu haboon.

Tusaaleyaasha ma, aha eh waxaa kale oo aad isticmaali kartaa howlgalka 1.3 ee soo socda, ee ku yaala buugga ardayga.

Tusaalaha soo socda ayaa loo isticmaali karaa ujeedadan.

Tusaale:- ka soo qaad in A utaagan tahay ardayda fasalka 6^{aad} .

Hadii cali yahay araday dhigta fasalka 6^{aad} , waxaan dhahaynaa Cali waa xubin ka mid ah ururka A.

Waxaanan u qornaa “Cali $\in$ A “ taasoo loo akhriyo cali waa kutirsane ururka A ah.

Haddii , Cabdi aanu ahayn ardayda dhigta fasalka 6^{aad} , dabadeed waxan u caddeyn karnaa tan “ Cabdi $\notin$ A “ taasoo loo akhriyo “ Cabdi ma,aha xubin ururka A “ ku caawi ardayda inay isticmaalaan summadaha ku haboon iyo tibxaha la xidhiidha ururka. Ka dooda su’aalaha 1t,3b,3j, iyo 4t ee layliska 1.1 adiga iyo ardaydaada fasalku.

Dabadeed u dir su,aalaha 1b,1j,2b,3t,4b iyo 4j ee layliska 1.1 shaqo guri ahaan, dood gaabana la yeelo markaad bilaabayso xiisada Labaad (ta ku xigta).

Hawgalka 1.1

1. Koox arday ah ayaa waxaa laga soo qaadayaa inay yihiin, koox kubdada cagta ah oo ka kooban 4 ciyaartooy, ururi digaagado, ardaydana jiiftaxa u jooji.
2. Dadka kubbada cagta ciyaaraya.
3. Koox kastaa waa 9 xubnood.

Urur madhan

Marka hore ku qor saburada waxoogaa urur ah (fiiri tusaalaha hoose) kaas oo leh ku tirsanayaal dhammaada.

Tusaale: A= {1, 3, 5} iyo B = {a, e, i, o, u}

Dabadeed ardayda waydii inay sheegaan inta ku tirsane ama xubnood ee ururkastaa leeyahay.

U tilmaan ardayda inay dhahaan:

- 1, 3 iyo 5 oo kaliya ayuu leeyahay ururka A, sidaasi darteed ururka A wuxuu leeyahay 3 xubnood.
- a, e, i, o iyo u oo kaliya ayuu leeyahay ururka B.

Sidaasi darteed ururka B wuxuu leeyahay 5 xubnood, marka xigta, qor tusaale urur aan lahayn wax ku tirsane ah, dabcan adigoo isticmaalaya weedho ahaan (sida ardayga).

Tusaale: ururka ardayda fasalka ee da'doodu tahay 100 jir.

Dabadeed waydii ardayda in ay taxaan xubnaha ururka haddii ay suurto gal tahay, hana sheegaan tirada xubnaha ururka. Waad waydiin kartaa haddii ay jiraan arday da'doodu tahay 100 jir ama waxaad dhihi kartaa ha soo horjoogsadaan ardayda horteeda. Ku hogaami ardayda in ay dhahaan "ururkani malaha xubno" ama "tirada xubnaha ururkani waa eber (0)".

Adigoo la xidhiidhinaya jawaabaha ardaydu bixiyeen, ku hogaami ardayda inay helaan fikrada urur madhan iyo summadiisa, taasi waxay tahay in aad ku hogaamiso ardayda inay dhahaan ururada noocan ahi ma'laha wax xubno ah, una sheeg in lagu magacaabo urur madhan ama urur aan waxba lahayn iyo in ururka madhan lagu sunto summada ama { }

{ogow in {∅} iyo { 0} aanay ahayn ururo madhan} tusaalayaal kale oo sa'id ah ayaa xaggan hoos ku taxan}

- Ururka bisadaha leh 8 lugood
- Ururka tirooyinka tirsiimo ee tiro dhaban iyo tiro kisiba ah.
- Ururka saddex xagalada leh 4 dhinac sii qeexida 1.2 ee ururka madhan ee ku qoran buugga ardayga. Waxaad u sheegi kartaa ardayda inay akhriyaan qeexida ku qoran buugga ardayga, una sharax waxa ay akhriyaan {xasuuso in aad isticmaasho in aad isu badasho haddii aad waqti u hayso} ka dooda hawlgalka 1.6 iyo su'aalaha 2, 3t iyo kh, 5b, 5x, 5r, 6t, ee layliska 1.2 ee ku yaala buugga ardayga, ardaydaada fasalka waxaad u diri kartaa qof-qof ama kooxo yaryar oo ka kooban 3 ilaa 5 in mid kastaa ka doodo su'aalaha xagga sare ku qoran. Markay ardaydu ka shaqeeyaan shaqada loo diray ku wareeg fasalka adigoo caawinaya shakhsiyada ama kooxda si qaldan u fahma ama qaldamaba in aad saxdo inta aanay samayn qalad wayn ama qalado waawayn.

  Dabadeedna u dir su'aalaha 1, 3b, j iyo x, 4, 5, 6t, 6j, 6d, 7b iyo j ee layliska 1.2 shaqo guri ahaan si koobana uga dooda su'aalaha ay arday badani kala kulmeen dhib xallinteeda (ama jawaabteeda)

Hawlgalka 1.2

b) {1, 2} t) ∅ ama {} j) ∅ ama {}

Ururada Dhamaadka leh iyo ururada aan dhammaan

Ururkan A ee soo socda ee leh kutirsanayaasha dhammaada ku qor sabuurada.

Tusaale: A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}.

Waydii ardayda inay sheegaan inta xubnood ama kutirsane ee ururka A leeyahay.

Caawi ardayda si ay u xaqiiqsadaan. Maadaama kutirsanayaasha ururka A ay isku daba taxan yihiin midba midka kale, kama dambayntii way dhammaadeen, isticmaal tusaalayaal la mid ah (xidhiidha) (waxa kale oo aad isticmaali kartaa Tusaaleyaal (Hawlgalka 1.3) ee buugga ardayga) si aad macnaha aad ugu caddayso u sheeg ardayda in ururada noocan ah aan ku magacawno ururo dhammaada. Dabadeed waydii ardayda inay bixiyaan tusaalayaal ururada dhammaada ah oo fasalkooda dhexdiisa ah, dugsigooda ama guri si aad u aragtid inay u fahmeen macnaha si sax ah.

Mida xigta, ku qor tusaalahan soo socda sabuurada.

B = {tirooyinka idil}

Dabadeed waydii ardayda inay sheegaan, haddii ay suurto gal tahay waa kee ku tirsanaha ugu wayn ururka B, ama haddii ay karayaan ha taxaan ku tirsanayaasha ururka B,

Tusaalaha 1.4: buugga ardayga waxaa sidoo kale loo isticmaali karaa in laga doodo.

Caawi ardayda si ay u xaqiiqsadaan, in aanay suurto gal ahayn in ay sheegaan ku tirsanaha ugu wayn ururka B ama aan latixi Karin dhammaan ku tirsanayaasha ururka B. u sheeg ardayda in ururada noocan ah lagu magacaabo ururo aan dhammaan. Waydii ardayda inay bixiyaan tusaalayaal ururo aan dhammaan ah si aad u hubiso inay fahmaan macnaha ururka aan dhammaan. Su'aasha 6 ee layliska 1.2 waxaa loo isticmaali karaa dood ahaan iyo laylis ku saabsan ururo dhammaada iyo kuwo aan dhammaan.

Jawaabaha hawlgalaka 1.3

b) 5 t) 5 j) 5 x) aan xadlahayn

Jawaabaha Laylis 1.1

1. b. si fiican buu u qeexan yahay, waayo, ku tirsanayaasha ama xubnaha ururka waa la kala saari karaa, 1, 2, 5 iyo 7.
   t. si fiican uma qeexna, waayo? ma jiraan wax heshiis ah oo sheegaya, waxa ay tahay "shimbira is jara" dabadeed xubnaha ururka si fiican looma kala saari karo.

j. si fiican uma qeexna, waayo? ma jiraan wax heshiis ah oo sheegaya macnaha "gabdhaha quruxda badan" dabadeed ku tirsanayaasha ururka si fiican looma kala saari karo.

x. si fiican buu u qeexan yahay, waayo? Xubnaha ururka, in kasta oo tiro ahaan ay badan yihiin waa la kala saari karaa.

2. b. $y \in s$ t. $y \notin s$

3. b. $\notin$ t. $\notin$ j. $\notin$ x. $\notin$

4. b. 4 t. 5 j. 5.

Jawaabaha layliska 1.2

1. jawaabaha suurta galka ahi waa:
   b. ururka laydiyada goobooyinka ah
   t. ururka laba jibbaaranayaasha leh 5ta dhinac
   j. ururka tirooyinka kisi ee ah tirooyinka dhaban
   x. ururka bisadaha leh lixda lugood.
2. B iyo t oo kaliya.
3. b. 1 t. 2 j. 3 x. 4 kh. 0
4. maya, waayo T (A) = 1, T (E)=0 iyo $1 \neq 0$
5. b. dhammaada t. aan dhamaan
   J. dhammaada x. aan dhamaan
   kh. dhammaada d. aan dhammaan
6. b. aan dhammaan t. 4 j. 5

1.2 XIDHIIDHKA KA DHEXEEYA URURADA

Xiisadaha loo qoondeeyey: 6 xiisadood

Waxa ugu yare ee ardaydga laga rabo

Dhammaadka cuttub hoosaadka ardaydu waxay awoodi doonaan in ay

- *Sharaxaan xidhiidhka ka dhexeeya ururada sida hormo- urur quman, hormo urur, ururo isle,eg iyo ururo isku dhigma.*

B) hormo- ururo

Sabuurada ku qor laba urur oo mid ku tirsaneyaashiisa dhammaantood ay ku dhexjiraan ururka kale.

Tusaale A = {1, 2, 3, 4,} iyo B= {2, 4}

Weydii ardayda xidhiidhka ka dhexeeya ururka A iyo ururka B. ku caawi aradayda inay cadeeyaan in ku tirsane kasta oo B ahi in uu yahay sidoo kale ku tirsane A, ama B inay ku dhexjirto A dabadeed u sheeg ardayda in xidhiidhka ka dhexeeya B iyo A la yidhaa horm-urur ku qor hadda ururka A ee lagugu siiyey xagga sare iyo ururka kale oo la yidhaa C sabuurada taasoo ururka C uu leeyahay ugu yaraan hal kutirsane oo aanu lahayn ururka A

Tusaale:-

A = {1, 2, 3, 4,} iyo C= {2, 5}

Weydii ardayda inay sheegaan xidhiidhka ka dhexeeya ururka A iyo ururka C. ka caawi ardayda si ay u caddeeyaan in 2 tahay kutirsane labada ururba ku jira A iyo C ba. Inkasta oo 5 ay tahay ku tirsane ururka C ah, laakiin 5 aanay ahayn ku tirsane ururka A leedahay. Taasi waxay tahay in $5 \in C$ laakiin $5 \notin A$.

Sidoo kale, ururka C dhammaantii kuma wada dhexjiro A (ama dhammaan xubnaha C maha xubno A leedahay .

Hadaba , waxaan dhahaynaa C ma,aha hormo ururka A, sii ama weydii ardayda iney akhriyaan qeexida 1.3 ee hormo ururka. Adigoo la xidhiidhinaya qeexida, xasuusi ardayda summadaha hormo- ururka, $\subseteq$ iyo hormo urur ma, aha $\not\subseteq$

Ka dooda adiga iyo ardaydaadu howlgalka 1.8 iyo tusaalaha 5^{aad} fasalka dhexdiisa.

Ardaydu ha caddeeyaan, gacantana ha ka qabtaan macnaha hormo urur ayagoo isticmaalaya tusaalayaal kale oo sharaxaya

Tusaale: ka soo qaad in

Ururka B = { b,t } sheeg hormo- ururka quman iyo hormo ururada ururka B. waxaa sameyn kartaa lammaaneyaal ama kooxo yaryar oo ka kooban 3 ilaa 5 arday midkastaa si uu uga dooda howlgalka 1.9 iyo su,aalaha 2iyo 4 ee layliska 1.3 marka ay shaqeynayaan waxaad ku wareegi kartaa fasalka, adigoo caawinaya ama siinaya tilmaan shaqsiyada iyo kooxahaba inta ugu badan ee loo baahan yahay (ay lagamamaarmaan tahay) waxaad u diri kartaa su,aalaha 1,3, iyo 5 ee layliska 3 shaqo guri ahaan, dood gaabana kala dood ardayda markaad dhigayso cashrka xiga.

T) Hormo urur quman

Bar hormo-urur quman iyo summadeeda ($\subset$) si la mid ah sidii aad u bartay hormo ururka waxaad ku bilaabi kartaa tani adigoo xasuusinaya ardayda waxyaalo ku saabsan qeexida hormo urur. Waxaad xasuusataa in hawlgalka 1.10 aan ku soo sheegnay tirada hormo urur ee urur leeyahay . laakiin kama aynaan hadal wax ku saabsan ku tirsaneyaasha uu leeyahay hormo ururkastaaa.

Si kastaba ha ahaatee, hormo- urur quman markaan leenahay ma,aha in aan eegno oo kaliya ama hubino in urur uu ku dhexjiro urur kale, laakiin sidoo kale waaa inaan eegno ama isberbar dhigno tirada xubnaha urur kasta , taasi waxay tahay haddii B ay tahay hormo urur quman ee ururka T . dabadeed ururka T waa in laga dhex helo ururka B. dabadeed ururka T waa inay jirto ugu yaraan hal ku tirsane oo ay dheertahay ururka B. adigoo isticmaalaya summado,

Waxaan u qori karnaa si soogaabsan sida :-

$A \subset B$ $A \subseteq B$ iyo $A \not\subset B$

Ogow in haddii ururada B iyo T ay yihiin ururo dhammada,dabadeed BCT BCT iyo A(B) < B(B)

Sii qeexida hormo-urur quman (qeexida 1.4) adigoo qeexidan raacayn si aad ugu caddayso fikirka, waxaad isticmaali kartaa

Tusaalaha 1.7 (B) ama ururo kasta oo kale oo la mid ah kuwan. Waxaa kale oo aad ka su'aalaha 6, 8 iyo 9 ee layliska 1.3.

Jawaabaha hawlgalka 1.4

Dhammaan kutirsaneyaasha B sidoo kale waa ku tirsaneyaasha T.

1.2.2 Ururada isku dhigma iyo ururada isle,eg.

B) Ururada isku dhigma

Xasuuso in markaan doonayno macnaha ururo isku dhigma in aan caddayno waa in aan isticmaalno habka isku beegida ama isku aadinta laba urur ku tirsaneyaashiisa mid mid ujeedadan darteed waa in aad qorto laba urur oo la mid ah kuwa lagugu siiyey qeybta casharada hordhaca ah ee buugga ardayga .

Xasuusi ardayda in isu dhignaanta laba urur oo kasta oo isku dhigmaa aanay ku xidhnayn nooca ku tirsaneyaashiisa, laakiin ay ku xidhan tahay isku beegnaanta mid midka ah eeku tirsaneyaashooda. Sii ardayda qeexida ururada isku dhigma (qeexida 1.5 ama weydii ardayda in ay ku qoraan buugtooda qoraalka ah . adigoo la xidhiidhinaya qeexida tus aradayda summada loo isticmaalo isku dhignaanta laba urur ↔ si kooban uga hadal sida loo isticmaalo adigoo isticmaalaya tusaaleyaal la mid ah, tusaalaha 1.7 ee buugga ardayga, waxaad u diri kartaa su,aalo aad ka dooratay layliska 1.5 shaqo guri ahaan.

T) Ururada isku midka ah

Marhadaad u qeexday isku dhignaanta laba urur ma adkaan doonto in aad barto macnaha ururo isku mid ah, waayo , taani waxaa weeyi ururo isku dhigma oo ku tirsaneyaashoodu isku mid yihiin (ayadoon la eegayn siday u kala horeeyaan) ayaa la yidhaa ururo isle,eg arintan darteed, waxaad qaadan kartaa laba ururo oo la mid ah kuwa buugga ardayga ama kuwa lagugu siiyey xagga hoose , weydii ardayda iney sheegaan xidhiidhkooda.

A = {□,△,○} iyo

B = {○,□,△}

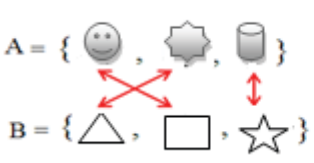
Markaad siiso qeexida ururada isku midka ah dabadeed (qeexida 1.6, buugga ardayga, bogga------,) ku caawi ardaydu inay sii fiican (cad) u fiiriyaan (fahmaan) guud ahaan (guud mar) "haddii A ⊆ B iyo A ⊆ B, dabadeed A = B" ka dooda hawlgalka 1.11 iyo tusaalaha 1.8 u na dir layliska 1.6.

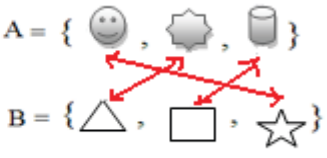
Jawaabaha Layliska 1.3

1. Haa, C ⊆ D, waayo ku tirsane kasta oo ururka J sidoo kale waa ku tirsane ururka D,
2. b. {Axad, Arbaco} t. {Sabti}
   j. {Khamiis}
   x. {Jamcey}
3. Jawaabaha suurto galka ahi waa: {b}, [t},Ø (ogow; inay jiraan 2^4 ama 16 hormo urur)
4. Jawaabaha suurto galka ahi waa
   b. ururka gabdhaha fasalka
   t. {tirooyinka kisi ee tirsiimo ee ka yar 10}9ogow: inay jiraan 2^9 ama 512 hormo urur)
   j. {w, z} (ogow: inay jiraan 2^4 ama 16 hormo urur)
   x. {Arbaca, Jimce} (ogow: inay jiraan 2^7 ama 128 hormo urur)
   kh. {laba jibaarane, laydi} (Ogow: barbaroole, koorta iyo qardhaastu yihiin shaxano 4 dhinacle ah)
5. Ø, {1}, {2}, {3}, {1,2}, {1,3}, {2,3}, {1, 2,3} t) Ø,{5}, {9},{5,9}
6. {2, 4, 5}, {k, n} (Ogow: inay jiraan $2^5 - 1$ ama 31) hormo urur.
7. b. $\not\subset$ t. ⊂ j. ⊂ x. ⊂
8. Haa, waayo? Arday kasta oo ka mid ah fasalkiinu waa xubin ka mid ah dugsigiisuna.

Jawaabaha Layliska 1.4

1.





2. b. T(B) =3, T (T) =3, T(F) = 4
   t. B, T IYO J waa ururo isku-dhigma.
3. Ururka X waa inuu yeesho 5 xubnood.

4. {p,q}, {p, r}, {p, s}, {q, r}, {q, s}, {r, s}.
5. b. x = {1, 2, 3…,9}
   y = {11, 12,…, 19} Sidaadarteed x ⟷ Y

   t. Ardayda fasalkaaga waxaa u dhigma ururka sananka fasalkaaga, sidaadrteed P ⟷ Q

   j. M uma dhiganto N, waayo waxaa jira dhago laban laab kabadan ardayda fasalka.

   [Tusaale T(N)= 2xT (M)], mana noqon karto mid mid mid isugu beegan. Arday kastaa wuxuu ku beegmayaa laba Gabdhood.

6. A = C waayo xubnahoodu waa iskumid
   B = D = F waayo xubnahoodu waa iskumid
7. Haa, A = B, waayo, labada urur waxay ka kooban yihiin ku tirsanayaal isku mid ah: 1, 3, 5, 7, 9.

1.3 ADEEGSIGA URURADA

Xiisadaha loo qoondeeyay: 10 xiisadood

Waxa ugu yare ee ardaydga laga rabo

Dhammaadka cutub hoosaadkan ardaydu waxay awoodi doonaan inay:

- *Sheegaan dhextaalka laba urur oo lagu siiyay*
- *Sheegaan isku-taga laba urur oo lagu siiyay*
- *Isticmaalaan jaantuska feen si ay ugu muujiyaan dhaxtaalka iyo isku-taga laba urur.*

U sheeg ardayda ujeedooyinka cuttub hoosaadka

i) bar ardayda macnaha shaqada dhextaal iyo shaqada u tagga ururada

ii) caawi ardayda si ay u sheegaan dhextaalka iyo isku taga laba urur.

Intaanad barin dhextaalka iyo isku tagga ururada ka hor, ardayga u dir inay akhriyaan hordhaca, buugga waydii ardayda inay sharax kooban ka bixiyaan waxay ka fahmeen waxay soo akhriyaan. Hubi in ardaydu ay awoodeen inay fahmaan ku falida ururada ay la mid tahay xisaab fallada aasaasiga ah ee isu qaybinta, kala goynta, isku-dhufashada iyo isku qaybinta, taasoo ay yaqaaneen, kuna soo barteen casharadii xisaabfallada ee fasaladoodii hoose.

1.3.1 Dhextaalka ururada

Xasuuso in dhextaalka laba urur uu yahay urur kale sida isu gaynta laba tiro oo tirsiimo ay u tahay tiro tirsiimo kale. Intaanad siin qeexida dhextaal ee ururada, qaado lammaane ururo ah sida kuwa lagugu siiyay buugga Ardayga, tusna ardayda siday u samayn lahaayeen dhextaal. Caawi ardayda inay helaan ku tirsanayaasha ay labada urur wadaagaan. Si aad u samayso in macnaha dhextaal ardayda u cadaato, waxaad u baahan tahay in aad qaadato tusaaleyaal ku saabsan ururada oo aad u fudud sida kuwa laynagu siiyay xagga hoose, caddeena (sheeg) ku tirsanayaasha ay wadaagaan labada urur.

Tusaale: B = {1, a, 2, t} iyo T = {2, c, 4, a} tirsanayaasha ururka B iyo T ee lagu siiyay xagga sare. Ururkani waa {a, 2}. U sheeg ardayda in labada urur leeyihiin ku tirsanayaal ay wadaagaan, waxaa ku magacawnaa "dhextaalka ururada" ururka ka kooban ku tirsanayaasha ay wadaagaan labada urur waxaa la yidhaa "dhextaal" badanaa, arday badani waxay isku qaldaan ururada (taasi waxay tahay, waxay u qaataan in dhextaalka laba urur uu la micno yahay dhextaal). Sidaas darteed, waxaad u baahan tahay si aad ugu kala saartid faraqa u dhexeeya macnaha labada urur ardayda si cad in aad siiso qeexida 1.7 ee dhextaalka, una bartid summada loo isticmaalo dhextaalka "∩" waa inaan qorno dhextaalka ururka B iyo ururka T, adigoo isticmaalaya summadaha sida "B∩T" taasoo loo akhriyo "B dhextaal T" haddaba, tusaalaha sare B∩T ={a,2}.

Ardaydu gacanta ha ka qabtaan sida loo go'aansho dhextaalka laba urur ayagoo isticmaalaya tusaalayaal kale sida kuwa xagga hoose lagugu siiyay.

B = {ardayda fasalkiina}
T= {gabdhaha fasalkiina}, dabadeed
B∩T = {gabdhaha fasalkiina}.

Adigoo la xidhiidhinayaya qeexida 1.7 ee dhextaalka, waxaad qeexi kartaa macnaha ururo aan xidhiidh lahayn, tan waxad samayn kartaa adigoo qaata tusaalayaal fudud, sida kuwa lagugu siiyay qeexida 1.7 ama ururo kale oo fasalkiina ah sida:

Jawaabaha Hawlgalka 1.7

- Kutirsaneyaasha ay leeyihiin ururada A iyo B labaduba waa r iyo s.
- Ururka ka kooban kutirsaneyaasha ay wadaagaan A iyo B waxaa lagugu siiyey {r, s}.

T ={wiilasha fasalkiina} iyo G ={gabdhaha fasalkiina} labadan urur ma laha ku tirsanayaal (xubno) ay wadaagaan, waayo ururka T wuxuu ka kooban yahay wiilasha oo kaliya, ururka G wuxuu ka kooban yahay gabdhaha oo kaliya. Taasi waxay tahay T∩G =∅ .sidaasi awgeed, labada urur ee T iyo G waa laba urur oo aan

xidhiidh lahayn. Adigoo ku daraya tusaalayaasha buugga ardayga, ka dooda hawlgalka 1.13 iyo su'aasha 1t ee layliska 1.7 sdiga iyo ardaydaadu. Una dir su'aalaha 1b iyo J iyo 2 ee layliska 1.7 shaqo guri ahaan, (ogow in, ereyga iyo marka qaarkood loo isticmaalo dhextaal adeegsiga ururada iyo inay tani ardayda u cadaynayso).

1.3.2 Isu-taga ururada

Isu-taggu waa hab kale oo uruada loo adeegsado, taasi waxay tahay sida dhextaalka laba urur u yahay urur kale ayuu isu-tagooduna u yahay.

(ogow in dhextaalka iyo isu-taga laba urur uu noqon karayo labada urur midkood haddii mid uu hormo urur u yahay ka kale). Si ka duwan dhextaalka ayaan u fiirinaynaa ku tirsanayaasha ay leeyihiin labada urur, ururka hore ama ururka labaad ama labada ururba. Intaanad u qeexin isu-taga ururada ka hor. Qaado lammaane ururo ah, una tilmaan ardayda si loo sameeyo isu-taga ayadoo laysu gaynayo ama laysu darayo labada urur. Waa in loo caddeeyo ardayda in ku tirsane kasta la qoro hal mar uun isu taga dhexdiisa ka fikir (fiiro) in ay soo laba jeer noqoto hal ku tirsane.

Ka dooda hawlgalka 1.14 una sheeg ardayda summada loo isticmaalo u taga "$\cup$" iyo si loogu isticmaalo si sax ah iyo habka ugu haboon. Sii ardayda inay akhriyaan qeexida u taga ee 1.8 ee buugga ardayga kala dooda hawlgalka 1.15 iyo Tusaalaha 1.9 ardayda fasalka. Ku hogaami ardayda (tilmaan) siday samayn lahaayeen weedh guud (hawraar) oo ku saabsan tirada ku tirsanayaasha ee isu-taga laba urur. Taas oo ah: laba urur oo kasta A iyo B.

$$B(A \cup B) \leq B(A)+B(B).$$

Arintan darteed, waxaad isticmaali kartaa su'aalaha 1b & X, 2b & x, 3 iyo 5b ee layliska 1.8 uguna dir su'aalaha layliska 1.8 inta hadhay shaqo guri ahaa.

Jawaabaha Hawlgalka 1.8

{Cadbi, cali, khaddar, xasan, Hodan, xamda, faadumo}

1.3.3 Jaantuska Feen

Jaantuska feen wuxuu si xaqiiq ah kaaga caawin sidaa u xaqiijin lahayd xidhiidhada ka dhexeeya laba urur oo lagu siiyay. Ku miijinta urur lagu miijiyo jaantuska feen kaama caawinayso oo kaliya in aad fiiriso xidhiidhka ka dhexeeya laba urur oo

kasta oo lagu siiyay, laakiin sidoo kale waxay kaa caawinaysaa si aad u fududayso ka shaqaynta aad ka shaqayn lahayd adeegsiga ururada iyo fur-furista masalooyinka. Arintan darteed, waa inaad qaadato saddex lammaane oo ururo ah kuwaasoo ah:

i) Labada urur waxay leeyihiin xubno ay wadaagaan, sida:
B ={1,2,3,4} iyo
T ={2, 3, 4, 5}

ii) Labada urur ma'laha xubno (ku tirsanayaal) ay wadaagaan, sida:
J ={1, 3, 5} iyo
X ={2, 4, 6}

iii) Urur ayaa ah hormo- ururta quman ee ururka kale, sida
Kh = {1, 2} iyo D ={1, 2, 3, 4}

Xasuusi ardayda in ururadu u taagnaan karaan goobooyin ama sida ukunta.

Ardayda si aad ugu caawiso inay aqoon qoto dheer u yeeshan sida loo muujiyo ururada, xidhiidhka ururada hormo ururada quman, dhaxtaalka iyo isu-taga ururada ayadoo la adeegsanayo jaantuska feen, iyo isticmaalka jaantuska feen si loo xalliyo masalooyinka, waxaad istixmaali kartaa tusaalayaasha 1.10, 1.11 iyo 1.12 ee buugga ardayga iyo su'aalaha 5 iyo 6 ee layliska 1.9, waxa kale oo aad isticmaali tusaalayaasha iyo laylisyada aan soo sheegnay ma aha eh, waliba inaad ka doodaan su'aalaha 1 iyo 3 ee layliska 1.9. waxaad u diri kartaa su'aalaha 2 iyo 4 ee layliska 1.9 shaqo guri ahaan(ogow, in mararka qaarkood, erayga "ama"

loo isticmaalo isku taga adeegsiga ururada, ayna tani ardayda u fududaynayso).

Jawaabaha Layliska 1.5

1. b. $A \cap B = \{a, e\}$ t. $A \cap B = \{3, 5, 7\}$ j. $A \cap B = \emptyset$
2. b. $A \cap B = B$ t. $A \cap \emptyset = 0$ j. $A \cap R = A$.
3. b. $A \cup B = \{a, b, c, d, e, f\}$
   t. $X \cup Y = \{2, 4, 6, 8, 10, 3, 9, 12\}$
   j. $A \cup Q = \{2, 4, 6, 8, 10, \Delta, \hat{\square}, \square\}$
4. b. $n(A \cup B) = 6$
   t. $n(X \cup Y) = 8$
   j. $n(A \cup Q) = 8$

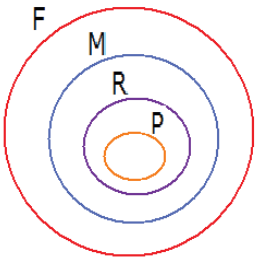
5. Haddii ay jiraan 4 – arday oo ka dhexeeya ardayda ururka xisaabta kooxda kubada cagta, dabadeed tirada ardayda ururka xisaabtu waa 22 – 4 = 18 kalya; tirada ardayda ee kooxda kubbada cagtuna waa 9-4 =5 kaliya. Sidaas darteed, tirada ardayda kooxda (ururka) xisaabta iyo ta ardayda kubada cagtu waxay isu yihiin 18+5+4 =27. Waxaan qori karnaa inagoo isticmaalayna summado sida: n(X∪Y) =n(X) +n(Y)- n (X∩Y)=22+9-4 = 27.
6. Sidaan isticmaalay su'aasha 3^{aad} ee xagga sare si la mid ah, ayaa la isticmaali karaa su'aashan hadaba, n(X∪Y) = n(X)+n(Y)-n (X∩Y)=a+b-c
7. b. A∪B = {2, 4, 6, 8, 1,3,5}; B∪A = (1,3,5,2,4,6,8}

   A∪B iyo B ∪ A waxay ka kooban yihiin ku tirsanayaal isku mid ah, waxay ku kala duwan yihiin siday ku tirsanayaasha u kala hormarsan yihiin qoraalka, haddaba A∪B = B∪A.

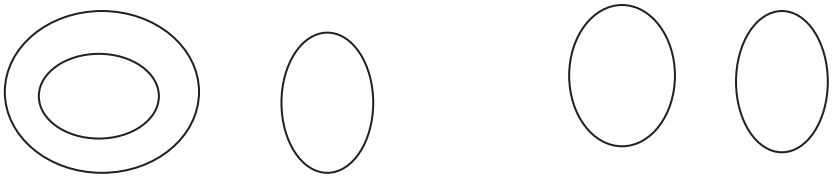
   t. (A∪B) ∪C = {2, 4, 6, 8, 1, 3, 5} ∪{b, t, j,x}
   = {2, 4, 6, 8, 1, 3, 5, b, t, j, x}
   A∪(B∪C) ={2, 4, 6, 8} ∪{1, 3, 5, b ,t, j, x}
   = {2, 4, 6, 8, 1, 3, 5, b, t, j, x}, haddaba
   (A∪B) ∪ C = A∪(B∪C), waayo waxay ka kooban yihiin ku tirsanayaal isu mid ah.

Jawaabaha Layliska 1.6

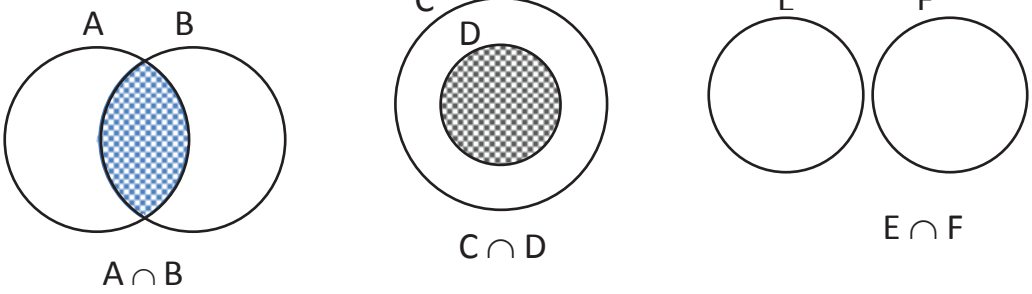
1.



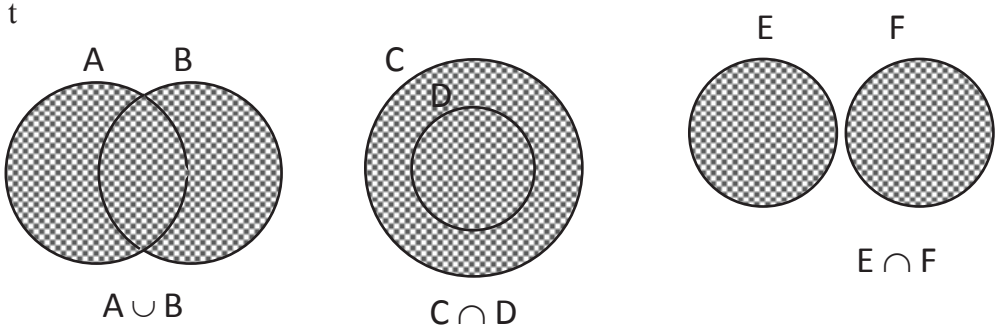
2. b. t.



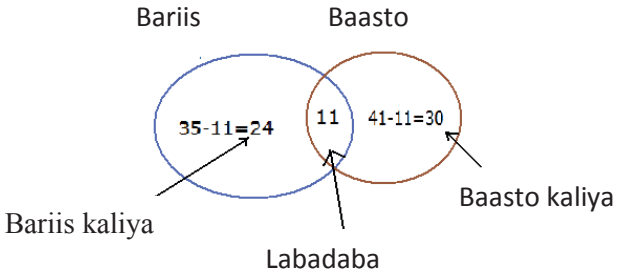
3. b.



t

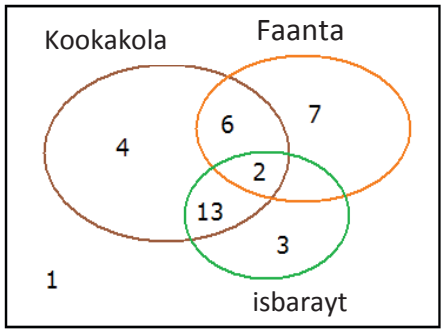


1. Wadarta tirada macaamiisha la soo indho- indheeyay waa 75. Maadaama 11 macaamiisha ahi ay intuba jecel yihiin bariiska iyo baastada. Tirada macaamiisha ee jecel Bariiska oo kali ahi waa 35-11 ama 24, tirada macaamiisha ee jecel baastada oo kali ahina waa 41 – 11 ama 30, dabadeed tirada macaamiisha ee bariiska iyo Baastadaba jeceli waa 11+24+30 = 65. Haddaba, macaamiisha hadhay ee aan jeclayn Bariiska iyo Baastada midna waa 75–65 =10



5. wadarta ardayda la soo indha indheeyay waa 36, maadaama laba ka mid ah ardaydu doorteen saddexdaba, tirada ardayda ee dooratay kookaha ama faantadu waa 8-2 = 6 kaliya; tirada ardayda ee dooratay kookada iyo isbaraytkuna waa 15-2 = 13 kaliya; 15ka dooratay faantada, 8 ka mid ahi waxay diirteen kooke iyo isbarayt.

Sidaas darteed 15-8 ama 7 waxay doorteen faanto kaliya. 25ka doortay kookaha, 21ka mid ahi waxay doorteen faanto ama isbarayt, sidaas darteed, 25-21 ama 4 ayaa doortay kooke kaliya, haddaba waxaan ku muujin karnaa xidhiidhadan jaantuska fee nee socda.



t. 7 arday ayaa doortay faanto.

j. 12 (ama 7+2+3) ayaa faanto ama isbarayt doortay.

x. tirada ardayda dooratay kooka koole ama isbarayt waa 20 (ama 4+13+3) kaliya. Tirada ardayda dooratay kooka koola ama faanto waa 17(ama 4+6+7) kaliya.

Tirada ardayda doortay faanto ama isbarayt waa 10 (ama 7+3)

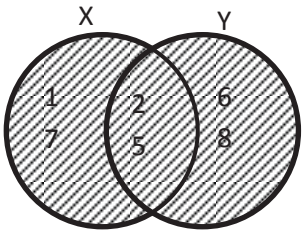
Haddaba, makhaayadu ha habayso ama (ha u kala horaysiiso) kooka kolaha iyo isbaraytka. Midka ardayda badankoodu doorteen.

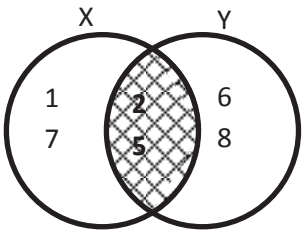
Jawaabaha Layliga naqtinka ee Cutubka 1aad

1. b. Aan si fiican u qeexnayn
   t. Si fiicau u qeexan
   j. Si fiican u qeexan
   x. Aan si fiican u qeexnayn
2. b. Aan dhammaad lahayn
   t. Dhammaad leh
   j. Aan dhammaad lahayn
   x. dhammaad leh
3. {4, 5} iyo {5, 6} waa hormo ururo
4. b. $\in$ t. $\subseteq$ x. $\subseteq$
5. b. $A \cup B = \{2, 3, 4, 5, 6, 7\}$ t. $A \cap B = \{4, 5, 6\}$
6. Ururada ku jira b. j iyo d waa ururo madhaan
7. b. Run t. Run j. Been x. Run

8. b. Been t. Been j. Been x. Run

9. b. t.





$x \cup y = (1, 2, 5, 6, 7, 8)$ $x \cap y = (2, 5)$

10. b. $A \cup B$ t. $C \cap D = D$, sababta oo ah $D \subseteq C$ j. $x \cap y$

CUTTUB 2 U QEYBSANAANTA TIROOYINKA IDIL

HORDHAC

Ujeedada ugu weyn ee cuttubkan 2aad waa in la baro Ardayda macnaha u qeybsanaanta tirooyinka iyo ta ugu badan ee loo isticmaalo barashada hababka hubinta/xeerarka u qeybsanaanta, taasoo ku saabsan u qeybsananta 2, 3, 4, 5, 6, 8, 9 iyo 10.

Inkastoo Ardaydu ay baran doonaan wax badau oo ku saabsau dhufsaneyaasha iyo isirada tirooyinka idil, iyo sida loo go'aamiyo ama raadiyo isirweynaha ay wadaagaan (IWW) iyo Dhufsaneyaraha ay wadaagaau (dh.y.w) laba Ama seddex tiro idil oo lagu siiyey oo ka kooban laba god Ama hal god.

Cinwaau hoosaadada waxaa ka mid ah:- Macuaha u qeybsanaan, u qeybsanaanta Tirooyinka idil, Dhufsaneyaasha iyo isirada, tirooyinka Mutuxan iyo kuwa Farcan, Isiraynta mutuxan, Isirada ay wadaagaan iyo dhufsaneyaasha ay wadaagaan, IWW iyo dhyw ee Tiroo-yinka idil.

Ujeeddooyinka Cuttubka

Marka cuttubka 2aad dhammaado dabadeed, Ardaydu waxay awoodi doonaan in ay:-

- *Caddeeyaan u qeybsameyaasha tirooyinka idel ee 2, 3, 4, 5, 6, 8, 9 iyo 10;*
- *Caddeeyaan tirooyinka idil ee mutuxan iyo kuwa farcan;*
- *Qoraan isirada mutuxan ee tiro idil oo lagu siiyey.*
- *Raadiyaan Ama Go'aamiyaan isirweynaha ay wadaagaan (IWW) laba Ama seddex tiro oo idil oo ka kooban hal god Ama laba god;*
- *Raadiyaan Ama go'aamiyaan dhufsaneyaraha ay wadaagaan (dhyw) laba Ama seddex tirooyin oo idil oo ka kooban hal god Ama laba god.*

Ilaha loo doorbiday hagayaasha cuttubka 2aad

- Muqarar, Buugga Ardayga iyo tilmaame Baraha xisaabta fasalka 6^{aad}.
- Kalkuleytarada fudud, sida
- Shaxaha isku – dhufashada
- Shaxo ka kooban 100 ka tirooyinka tirsiimo ee ugu horeeya, sida ,

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- Qalin qoriyo leh midabo kala duwan ama midabo kala duwan (oo ardyda ah)

2.1 MACNAHA U QEYBSANAANTA

Xiisadaha loo qoondeeyey: 6 xiisadood

Waxyaalaha laga rabo ardayga

Marka uu dhammaado cuttub-hoosaadka 2.1 Ardaydu waxay Awoodi doonaau in ay:

- *Coddeeyaan/dib u habeeyaan hubinta Ama xeerarka u qeybsanaanta tirooyinka idil ee 2, 3, 4, 5, 6, 8, 9 iyo 10.*
- *Ku shaqeyuta xeerarka hubinta u qeybsanaanta si looga jawaabo su'aalaha.*

Erayo Cusub

U qeybsanaanta, isiro, dhufsaneyaal, islraynta mutuxan, isirweynaha ay wadaagaan (IWW), dhufsaneyaraha ay wadaagaan (dhyW).

Tijaabooyinka/xeerarka u qeybsanaanta

Gudbinta Cashar ka:

(Fikrado ku saabsan barista Ama dhigista cinwaanada lagama maarmaauka ah ee cuttub – hoosaadka 2.1)

Hordhac

U jeedada ugu weyn ee casharkani waa sidii loo bari lahaa Ardayda macnaha u qeybsanaanta tirooyinka iyo hubinaha/xeerarka u qeybsanaanta tirooyinka idil ee 2, 3, 4, 5, 6, 8, 9 iyo 10. Iyo inay awoodaan in ay ku dabakhaan xeerarkan xallinta masalooyinka.

Ardayda casharka waad bari kartaa idinka oo ka doodaya masalooyin ka ku yaala buugga Ardayga. Ardaydu ha ka doodaan su'aasha. Waa maxay Aqoonta xisaabeed ee uu u baahan yahay Axmed si uu u xalliyo masalada furan?

U tilmaan Ardaydu in ay dhahaan:- Axmed waa inuu helaa dhammaan lammaaneyaasha isirada ee 144. Dabadeed, u sharax Ardayda iu caharkani uu muhimada saari doono macnaha u qeybsanaanta tirooyinka idil, iyo barashada hubinta/xeerarka u qeybsanaanta ee inta ugu badan loo isficmaalo u qeybsanaanta tirooyinka idil ee 2, 3, 4, 5, 6, 8, 9 iyo 10.

Inagoo casharka tixraacayna, Barayaashu waa in aanay in badan ka fekirin ama muhimada siin sida loo soo dhiraandhiriyo/ama loo helo qaaciidada tijaabinta/xeerarka laakiin, ay awooda saaraan sida loo go'aamiyo dabikhidooda, Tusaale ahaan, isirkaay wadaagaan ama dhufsaneyaasha ay wadaagaan iyo Isirweynaha ay wadaagaan (IWW) Ama dhufsaneyaraha ay wadaagaan (dhuw) laba Ama seddex tiroyyiu oo ka kooban ha lama laba god. Soo dhiraandhirinta hubinaha/xeerarka u qeybsanaanta tirooyinka idil ee 2, 3, 4, 5, 6, 8, 9 iyo 10. Waa in loo sameeyaa si talaabo – talaabo ah ayadoo ardayda lagala doodayo sida uu tilmaamayo qorshaha qeybinta ee hoos ku qorani.

Hubinaha Ama xeerarka kale ee u qeybsanaan, sida qeybsanaanta taramaha iyo uqeybsanaanta Wadaraha Ama faraqyada.

Waa in loo tixgaliyaa sida kuwan inaga caawin doona hubinta u qeybsanaanta tirooyinka qaar ka mid ah (4 iyo 8) inagoo tau tixgalinayna, qoondaynta qeybinta xiisadaha ee soo socda ayaa la qorsheeyey/baahday.

1. Qorshaha Qeybinta
   - Casharka 1^{aad}:- Barista tijaabooyinka/ xeerarka qeybsanaanta 2, 3 iyo 5.
   - Casherka 2^{aad}:- Barista tijaabooyinka/xeerarkauqeybsanaanta 6, 9 iyo 10
   - Cashaerada 3^{aad} iyo 4^{aad}:- Barista tijaabooyinka u qeybsanaanta taramaha iyo u qeybsanaanta wadaraha/faraqyada
   - Sii gudo – galka tijaabooyinka/xeerarka u qeybsanaanta 4 iyo 8.
2. Dardar – gelin: masalooyinka hordhaca ah ee Buugga Ardayga ku jira Waxaa loo isticmaali karaa in la nakhtiimo nuxurka (macuaha) uqeybsanaanta ayadoo lala xidhiidhinayo taranta tirooyinka; taas oo ahi xidhiidhka ka dhaxeeya tarauta iyo isirada, iyo habka (jidka) isir kasta loogu caddayn (muujin) karo xidhiidh taraneed.

Tusaale ahaan: 42 wey u qeybsantaa 7 waayo 42 ÷ 7 = 6 (ama 42 = 7 × 6). Isir kastaa (Sida, 6, 7) waa isirka taranta, 42. Sidoo kale 42 waa dhufsane isir kasta (ama tarantn waxay u qeybsantaa isir kasta Ama qeybiye kasta).

B) Ka shaqeynta tijaabooyinka/xeerarka u qeybsanaanta 2, 3 Ama 5. Guud ahaan habku waa in uu la mid ahaado ka lagugu siiyey Ama ku yaal beuugga Ardayga ayadoo la isticmaalayo hawlgalka 2.1 ee shaxda 1aad ee isku – dhufashada tiro kasta, lana eego qaabka taramaha laga helay jog u tax kasta Ama isugeynta (ururin) xidhiidhka ka dhaxeeya tirooyinka ku jira hal joogtax iyo kuwa kale. Waad soo koobi kartaa Dooda adigoo isticmaalaya xeerarka 1, 2 iyo 3 (Tijaabooyinka u qeybsanaanta 2, 3 iyo 5) ee buugga Ardayga.

Tusaalaha (Tusaalaha 1aad) xeerarkan soo socda waxaa loo isticmaali karaa in casharka lagu xoojiyo, dabikhid, suaalo laga doorto layliska 2.1 (laga dhexdoorto su'aalaha 1, 2, 7, 8, 9) Waxaa loogu diri karaa shaqo guri ahaan.

T) Ka shaqeynta tijaabooyinka/xeerarka u qeybsanaanta ee 6, 9 ama 10 (xeerarka 4, 5 iyo 6). Habka ama hababka loo isticmaalo tijaabooyinka/xeerarka u qeybsanaanta ee 2, 3 iyo 5 waa loo isticmaali karaa halkan

Waa in loo caddeeyo Ardayda in u qeybsanaanta 3 ama 9 aan loo habayn Karin si la mid ah u qeybsanaanta 2, 5 ama 10 (sida Fiirinta godka ugu dambeeya ama godadka tirooyinka) waayo ma jirto jibbaarka 10 oo u qeybsama 3 Ama 9. Habka lagu isticmaalo 3 iyo 9 Wuxuu noqon in la eego "wadarta godadka" ee tiro kasta oo idil ama wadarta godadka isku – xiga, lana hubiyo in wadaraha la helay u qeybsamaan 3 ama 9, Tusaalaha 2, xeerarka soo socda ee 4, 5 iyo 6 (Buugga Ardayga) waa loo isticmaali karaa ujeedadan.

J) ka shaqeynta tijaabada/xeerka u qeybsanaanta 4 (Xeerka 7aad)

Intaan laga shaqeyn tijaabada/xeerka u qeybsanaanta 4 (iyo sidoo kale 8). Waxaa u baahau tahay marka hore in aad tixgaliso laba tijaabooyin oo ku saabsau qeybsanaanta taramaha iyo uqeybsanaante wadarahe/Faraqyada tirooyinka ayadoo ay ku caawinayso hawlgalka 2.2 iyo shaxda 2aad ee Buugga Ardayga.

X) Marka u horeysa, u tilmaan ardayda in ay gartaan in tiro kasta oo a la yidhaa ay u qormi karto tarau tiro kale oo la yidhaa b iyo 100 (sida: a = b × 100) Ama wadarta dhufsanahan oo kale iyo tiro tirsiimo ee C taas oo ka yar 100 (sida: a = b × 100 + c).

Kh) Dabadeed, ka caawi Ardayda si ay u xaqiiqsadaau in tijaabada/xeerka u qeybsanaanta 4 ay ku xidhan tahay u qeybsanaanta loo geeye kasta oo loo geeyo tibaaxda sare 4. Habkani waxaa lagu qorsheeyey hoos.

U qeybsanaanta 4

7324 = 7300 + 24 (marka la kala jajabiyo: loo geeyaha 1^{aad} waa dhufsanaha 100).

= 73 × 100 + 24 (4 waa isirka 100: hadaba 4 waa qeybiye 73 × 100)

Waxaa kale oo aan ognahay in 4 ay tahay qaybiye 24 waayo 24 ÷ 4 = 6.

Haddaba, labada laysu geeyaaba wey u qeybsamaan 4.

Sidaa darted, 4 waa qeybiye 73 × 100 + 24 sidaas darteed wadartu wey u qeybsantaa 4.

Taas macnaheedu waa, 7324 wey u qeybsantaa 4.

Jawaabaha hawlgalka 2.1

Joogtaxa 1^{aad}	Joogtaxa 2^{aad}	Joogtaxa 3^{aad}	Joogtaxa 4^{aad}	Joogtaxa 5^{aad}
1			4	
2		6		
3	6			15
4		12		
5				
6	12			
7			20	
8				
9				
10		30		
18			72	90
26	52			
44		132		

Ardaydu sidoo kale ha ka doodaan Tusaaleyaasha 3 iyo 4 (ee Buugga Ardayga) si ay aad ugu fahmaan.

- U tilmaan Ardyda in tijaabada/xeerka u qeybsanaanta 4 ay ku xidhau tahay tirade ka samaysanta labada go dee ugu dambeyya tirade idil ee lagu siiyey (sida tirade ka samaysanta godadka tobnaadka iyo koowaadka).

- Tijaabada/ xeerka u qeybsanaanta 4 waxaa loo soo dhiraandhiriyey loona dabakahya sida ka muuqata buugga Ardayga. (Fiiri qoraalada ku jira sanduuqyada iyo Tusaalaha 5aad)
- Aqoonta iyo Awooda ayu heleen Ardaydu ilaa iyo hadda tijaabooyinka/xeerarkan qeybsanaanta 4 waxaa lagaga sii dhaadhicin karaa ayadoo ardyda la weydiiyo si'aalo Afka ah inay ka jawaabaan, sida suaasha 3aad ee layliska 2.2 ee buugga Ardyga.
- Tijaabada/xeerka u qeybsanaanta 8 (Xeerka 8aad) waxaa u habayn kara si la mid ah sida tijaabada/xeerka u qeybsanaanta 4 (xeerka 7aad). Ardayda waa in loo diro inay akhiryaan buugtooda si madax banaan. Dhammaadka, baruhu waa in uu sameeyaa is barabar dhig, taas oo caddeynaysa waxay isaga mid yihiin iyo waxay ku kala duwan yiliin labada xeer (u qeybsanaanta 4 iyo u qeybsanaanta 8).
- Aqoonta iyo Awooda ay ardydu u heleen ilaa hadda tijaabooyinka/xeerarka u qeybsanaanta 8 marka hore waa in lagu khasbo ayadoo la weydiinayo Ardayda inay ka jawaabaan su'aalo, Tusaale ahaan, su'aasha 6aad ee layliska 2.2 ee buugga Ardayga si af ahaaneed.
- Laylisyada Buuggaagta kale ee la Akhristo si ay u fahmaan tijaabooyinka/xeerarka u qeybsanaanta 4 iyo 8, si loo hubiyo in tiro idil oo lagu siiyey ay u qeybsanto 4 Ama 8 waa in loo diraa shaqo guri.

Si looga dhigo Aqoonta iyo Awooda ay u leeyiun u qeybsanaanta 4 iyo 8 mid qota – dheer waa in la isficamaalaa su'aalaha 4, 5, 6 iyo 7 ee layliska 2.2 ee Buugga Ardayga.

Jawaabaha layliska Cuttub – hoosaadka 2.1 Jawaabaha layliska 2.1

1. b. 25 way u qeybsantaa 5 waayo godka khaanada koowaadku waa 5; laakiin 25 uma qeybsanto 2 waayo godka khaanada koowaadku waa 5, mana aha tiro dhaban 25 uma qeybsanto 3, waayo wadarta godadkeedu waa 2 + 5 = 7 umana qeybsanto 3.

   t. 30 wey u qeybsantaa 2, 3 iyo 5, waayo khaanada koowaadku waa (0) waana tiro dhaban, wadarta godadkeeduna 3 + 0 = 3 weyna u qeybsantaa 3, god koowaadkeeduna waa 0.

   j. 73 uma qeybsanto 2, 3 iyo 5, waayo godka koowaadku waa (3) mana aha tiro dhaban, wadarta goodadkeedu waa 7 + 3 = 10 umana qeybsauta 3, god koowaadkeeduna waa 3 wuuna ka duwan yahay 0 iyo 5.

   x. 346 wey u qeybsantaa 2, waayo godka koowaadku waa (6) waana tiro dhaban, laakiin 346 uma qeybsanta 3 ama 5 midna waayso, wadarta

godadku waa 3 + 4 + 6 = 13, ta 13 – na waa 1 + 3 = 4 umana qeybsamaan 3, godkeeda koowaadkun a waa (6) wuuna ka duwan yahay 0 iyo 5.

Kh. 1034 wey u qeybsantaa 2, waayo godka koowaadku waa (4) waana tiro dhabau, laakiin 1034 uma qeybsanta 3 iyo 5 midkoodna waayo wadarta godadkeedu waa 1 + 0 + 3 + 4 = 8 umana qeybsamo 3, godkiisa koowaadkuna waa (4) wuuna ka duwan yahay 0 iyo 5.

2. b. 3660 way u qeybsantaa 2, 3 iyo 5 waayo godkeeda koowaadku waa (0) waaua tiro
dhaban, wadarta godadkeeduna waa 3 + 6 + 6 + 0 = 15, ta 15 waa 1 + 5 = 6 labadubana wey u qeybsamaan 3, godkeeda koowaadkuna waa 0.

t. 2670 wey u qeybsautaa 2, 3 iyo 5, waayo khaanada godkeeda koowaadku waa (0) waana tiro dhaban, wadarta godadkeeduna waa 2 = 6 + 7 + 0 = 15, ta 15 – na waa 1 + 5 = 6 labadubana wey u qeybsamaan 3, godkeeda koowaadkuna waa 0.

j. 3998 wey u qeybsantaa 2, waayo khaanada godka koowaadku waa (8) waana dhaban; laakiin 3998 uma qeybsanto 3 iyo 5 waayo, wadarta godadkeedu, 3 + 9 + 9 + 8 = 29 ka 29 – na waa 2 + 9 = 11 umana qeybsamaan 3, godkeeda koowaadkuna waa (8) wuuna ka duwan yahay 0 iyo 5.

x. 49998 wey u qeybsantaa 2 iyo 3, waayo godkeeda koowaadku waa (8) waana dhaban. Wadarta godadkeeduna waa 4 + 9 + 9 + 8 = 30, ta 30 – na waa 3 + 0 = 3 labadubana wey u qeybsamaan 3, laakiin 4998 uma qeybsanta 5 waayo godkeeda koowaadku waa (8) wuuna ka duwan yahay 0 iyo 5

kh. 4815 wey u qeybsantaa 3 iyo 5, waayo, wadarta godadkeedu waa 4 + 8 + 1 + 5 = 18, ta 18na waa 1 + 8 = 9 labadubana wey u qeybsamaan 3; godkeeda koowaadkuna waa 5. Laakiin 4815 uma qeybsanta 2, waayo godkeeda koowaadku waa (5) mana aha dhaban.

d. 1845 wey u qeybsantaa 3 iyo 5, waayo wadarta godadkeedu waa 1 + 8 + 4 + 5 = 18 la 18 – na waa 1 + 8 + 9 labadubana wey u qeybsamaan 3, godkeeda koowaadkuna waa (5), laakiin 1845 uma qeybsanto 2, waayo, godkeeda koowaadku waa (5) mana aha dhaban.

r. 5280 wey u qeybsantaa 2, 3 iyo 5 waayo godkeeda koowaadku waa (0) waana dhaban wadarta godadkeeduno waa 5 + 2 + 8 + 0 = 15, ta 15 – na waa 1 + 5 + 6 labadubana wey u qeybsamaan 3 godkeeda koowaadkuna waa 0.

s. 7275 wey u qeybsantaa 2 ama 5, waayo, wadarta godadkeedu waa 7 + 2 + 7 + 5 = 21, ta 21 – na waa 2 + 1 = 3 labadubana wey u qeybsamaan 3. Godkeeda koowaadkuna waa 5; laakiin 7275 uma qeybsanta 2, waayo, godkeeda koowaadku waa (5) mana aha dhaban.

3. b. haa, waayo 108 wey u qeybsantaa 2 iyo 3 ba

t. Maya, waayo 333 uma qeybsanto 2.
j. Maya, waayo 254 uma qeybsanta 3
x. Haa, waayo 444 wey u qeybsantaa 2 iyo 3 ita.
Kh. Haa, waayo qoo wey u qeybsantaa 2 iyo 3 – ba.

4. b. Haa, waayo wadarta godaka 108, waa 1 + 0 + 8 = 9 weyna u qeybsantaa 9.

t. Haa, waayo wadarta godadka 801, waa 8 + 0 + 1 + 9 weyna u qeybsantaa 9.

j. Maya, waayo, wadarta godadka 376 waa 3 + 7 + 6 = 16, ta 16; 1 + 6 = 7 umana qeybsamaan 9.

x. Haa, waayo, wadarta godadka 414 waa 4 + 1 + 4 = 9 wayna u qeybsantaa 9.

Kh. Haa, waayo wadarka godadka 1152 waa 1 + 1 + 5 + 2 = 9 weyna u qeybsantaa 9.

5. Kaliya (t) 330 iyo (kh) 1770 ayaa u qeybsama 10, waayo, godka koowaadku waa 0. Tirooyinka soo hadhay uma qeybsamaan 10, waayo tiro kasta godkeeda koowaadka ayaa ka duwan 0.

6. b. 4920 wey u qeybsantaa 6 iyo 10, waayo godka koowaad ku waa 0, kaas oo macnahiisu yahay wey u qeybsantaa 2 iyo 10. Sidoo kale wadarta godadku waa 4 + 9 + 2 + 0 = 15 ta 15 – na waa 1 + 5 = 6 weyna u qeybsantaa 3, taas oo macnaheedu yahay inay u qeybsant 6. laakiin 4920 uma qeybsanto 9, waayo wadarta godadkeedu, sida ka muuqata xagga sare uma qeybsanta 9.

t. 4896 wuu u qeybsamaa 6 iyo 9. Labana wuu u qeybsamaa, waayo, godkeeda koowaadku waa (6) waana dhaban. Sidoo kale 3 iyo 9 na wey u qeybsantaa, waayo wadarta godadkeedu waa 4 + 8 + 9 + 6 = 27 ta, 27 na waa 2 + 7 = 9 weyna coddahay inay u qebsantaa 3 iyo 9. Wey u qeybsantaa 6 waayo 2 iyo 3 ayey u qeybsantaa. Laakiin 4896 uma qeybsanta 10 waayo godka koowaadku ma aha 0.

j. 6993 wey u qeybsautaa 9, waayo wadarta godadkeedu waa 6 + 9 + 9 + 3 = 27 ta 27 – na

waa 2 + 7 = 9 weyna ceddahay inay u qeybsanta 9. Laakiin 6993 uma Qeybsantaa 6 iyo 10 midna, waayo uma qeybsanta 2, godkeeda koowaadkuna waa (3) mana aha 0 siday isugu xigaan.

x. 49998 wey u qeybsantaa 6, waayo waxay u qeybsantaa 2 iyo 3, laakkiin 49998 uma qeybsanta 9 Ama 10 midua waayo, wadarta godadkeed waa 4 + 9 + 9 + 8 = 30 ta 30 – na waa 3 + 0 = 3 umana qeybsamaan 9, godkeeda koowaadkuna waa (8) mana aha 0 siday isugu xigaan.

Kh. 3780 wey u qeybsantaa midkesta oo ka mid ah tirooyinka idil ee 6, 0 iyo 10 sababo la mid ah kuwa xagga sare awgeed.

d. 5555 uma qeybsanta midka mid ah tirooyinka idil ee 6, 9 iyo 10 sababo la mid ah kuwa xagga sare Awgeed

r. 5700 wey u qeybsantaa 6 iyo 10. Laakiin 5700 uma qeybsanta 9, sababo la mid ah kuwa xagga sare Awgeed.

s. 7880 wey u qeybsantaa 10 laakiin 7880 uma qeybsanta 6 ama 9 midna sababo la mid ah kuwa xagga sare awgeed.

7. Jamaal iyo 4 saaxiibadiis ahi waxay noqdaan 5 qof 82 uma qeybsanto 5. ($16 \times 5 < 82 < 17 \times 5$), Hadaba suurtogal ma'aha in orde kastaa ku ordo kiiloomitir isku mid ah.

8. Haa, waayo 36 wey u qeybsantaa 2. (shaqaalaha maktabadu waxay ku dhamaystiri karaan inay ku buuxiyaan khaanad kasta 18 buug oo midkasta dhumucdiisu tahay 2sm) – Haa, waayo 36 wey u qeybsntaa 3. (shaqaalaha maktabadu waxay ku dhamaystiri karaan inay ku buuxiyaan khaanada 13 buug oo midkasta dhumucdiisu tahay 3sm)

9. b. maya, waayo 175 uma qeybsanuto 2 (Godka koowaadku waaJ,

mana aha dhaban)

t. maya, waayo 175 uma qeybsamo 3 (wadarta godadkeedu waa 1 + 7 + 5 + 13, umana qeybsanto 3)

j. Haa, waayo 175 wey u qeybsantaa 5, waayo godka koowaadka ee tirade waa 5.

x. maya, waayo 175 uma qeybsanto 9. (wadarta godadku waa 1 + 7 + 5 = 13, umana qeybsanto 9).

Jawaabaha hawlgalka 2.2

b	t	b-miyey u qeybsantaa 3?	t-miyey u qeuybsantaa 3?	b + t miyey u qeybsantaa 3?
12		Haa	Maya	Maya
17		Maya	Maya	Maya
15		Haa	Haa	Haa
48		Haa	Haa	Haa

Jawaabaha Layliska 2.2

1. b. x + y = 600 + 78 uma qeybsanto z = 4, waayo 78 uma qeybsanto 4
   t. x + y = 78 + 36 wey u qeybsantaa z = 6, waayo 78 iyo 36 – ba wey u qeybsamaan 6.
   j. x + y = 21 + 220 uma qeybsanto z = 7, waayo 220 uma qeybsanto 7
2. b. Run, waayo 5 waa qeybiyaha 65 iyo 70
   t. Been, waayo 4 qeybiye uma aha 38
   j. Been, waayo 3 qeybiye uma aha 220 Ama 25 midna.
3. b. haa, waayo tirada ka samaysanta labada god ee ugu dambeeyaa waa 16, weyna u qeybsantaa 4.
   t. haa, waayo tirada ka samaysanta labada god ee ugu dambeeyaa waa 24, weyna u qeybsantaa 4.
   j. maya, waayo tirada ka samaysanta labada god ee ugu dambeeyaa waa 75, umana qeybsanto 4.
   x haa, waayo tirada ka samaysanta labada god ee ugu dambeeyaa waa 20, weyna u qeybsantaa 4.
   Kh. haa, waayo tirada ka samaysanta labada god ee ugu dambeeyaa waa 52, weyna u qeybsantaa 4.
4. Qaar ka mid ah jawaabaha suurtogalka ahi waa:- 31412; 10520; 49208; 56724; 71056. Waad tixi kartaa tirooyin kale oo tirada ka samaysanta labada god ee ugu dambeeyaa ay u qeybsanta 4, sida kuwa ku dhammaada 04, 08, 12, 16. 20, 24, 28 IWM.
5. Midkasta oo ka mid ah 10 kan god (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) waa lagu jawaabi karaa, waayo tirada ka samaysanta labada god ee ugu dambeeyaa, 32 wey u qeybsantaa 4.
6. b. haa, waayo tirada ka samaysanta seddexda god ee ugu dambeeyaa, 320 wey u qeybsantaa 8.

t. haa, waayo tirada ka samaysanta seddexda god ee ugu dambeeyaa, 776 wey u qeybsantaa 8.

j. haa, waayo tirada ka sameysanta seddexda god ee ugu dambeeyaa 056 wey u qeybsantaa 8.

x. maya, waayo tirada ka samaysanta seddecda god ee ugu dambeeyaa, 641, uma qeybsauta 8.

Kh. haa, waayo tirada ka sameysanta seddexda god ee ugu dambeeyaa, 128, wey qeybsantaa 8.

7. Waxay noqou kartaa eber ama 8 kaliya, waayo 120 iyo 128 wey u qeybsamaan 8.

8. b. 918 uma qeybsanto 4 iyo 8 midna

t. 2470 uma qeybsanta 4 iyo 8midna

j. 1700 wey u qeybsantaa 4, lakkiin uma qeybsanto 8.

x. 2348 wey u qeybsantaa 4, laakiin uma qeybsanto 8.

Kh. 16454 uma qeybsanto 4 iyo 8 midna

9.

Tiro kasta oo Tirsiimo oo ku dhemmaata	0	2	4	5	6	8	00
Wey u qeybsantaa	2, 5, 10	2	2	5	2	2	2, 4, 5, 10, 100

10. b. 120 wey u qeybsantaa 10, 2 iyo 5, laakiin uma qeybsanto 100.

t. 159 u ma qeybsanta midkasta oo ka mid ah tirooyinkan:- 10, 100, 2 ama 5.

j. 6400 wey u qeybsantaa dhemmaan tirooyinka: 100, 10, 2, iyo 5.

Kh. 8775 wey u qeybsan taa 5, laakiin uma qeybsanta 10, 100 Ama 2.

d. 56040 wey u qeybsantaa 10, 2 iyo 5, laakiin uma qeybsanto 100.

r. 780000 wey u qeybsantaa dhammaan tirooyinka: 10, 100, 2 iyo 5.

s. Eber wuu u qeybsamaa dhammaan tirooyinka:- 10, 100, 2 iyo 5 (ogow: 0 tirona uma aha qeybiye)

11. tirada Ardydu waa 120. Ardaydan waxaa loo qeybin karaa kooxo ka kooban 2, 3, 4, 5, 6, 8 ama 10 Arday koox kasta.

12. Tirada Buuggaagtu waa 3488

    1. 3, 488 wey u qeybsantaa 2, maxsuulka isu-qeybintuna wuxuu ina siinayaa 1, 744.

    2. 3,488 wey u qeybsantaa 4, maxsuulka isuqeybintuna wuxuu ina siinayaa 872.

    3. 3, 488 wey u qeybsantaa 4, maxsuulka isu-qeybintuna wuxuu ina siinayaa 436. Inkasta oo, shaqaalaha maktabadu uu doonayo in uu dhigo qolkasta tiro isle'eg oo buugaag ah oo u dhaxaysa 500 iyo 1000. Kaliya (2) ayaa raali kaliya xaaladan. [ogow, in 1744 iyo 36 ayna ka mid ahayn tirooyinka u dhexeeya 500 iyo 1000]. Hadaba, maktabadu waxay yeelan kartaa 4 qol.

2.2 DHUFSANEYAASHA IYO ISIRADA

Xiisadaha loo qoondeeyey: 21 xiisadood

Waxa laga rabo Ardayga

Marka uu dhemaado cuttub – hoosaadka 2.2 dabadeed, Ardaydu waxay Awoodi doonaan in ay:

- *sharaxaan Fikradaha dhufsaneyaasha iyo Isirada;*
- *caddeeyaan tirooyinka mutuxan iyo kuwa farcan.*
- *caddeeyaan tirooyinka isirada ay wadaagaan yahay oo kaliya hal.*
- *Qoraan isirada mutuxan ee tiro idie oo aan ka badnayn seddex god oo lagu siiyey.*
- *Sharaxaan fikradaha isirka ay wadaagaan iyo isirka ugu weyn ee ay wadaagaan laba Ama seedex tirooyin idil oo lagu siiyey.*
- *Go'aamiyaan isirweynaha ay wadaagaan (IWW) laba Ama seddex tiro oo idil oo ka kooban ha lama laba god.*
- *Sharaxaau fikradaha dhufsaneyaasha ay wadaagaan iyo dhufsaneyaraha ay wadaagaan laba Ama seddex tior oo idil.*
- *Go/aami yaau dhufsaneyaraha ay wadaagaan (dhyw) laba ama seddex tiro oo idil oo ka kooban ha lama laba god.*

Jawaabaha Hawlgalka 2.4

b. haa t. haa

Gudbinta Casharka

(Fikradu ku saabsan barista Ama dhigista cinwaanada lagama maarmaanka ah ee cuttubhoosaadka 2.2.1)

2.2.1 Nakhtiinka Dhufsaneyaasha iyo qeybiyeyaasha

Hordhac

Casharkan waa in loo isticmaalo ka dhaadhicinta Aqoonta iyo Awooda ay u yeelau doonaan Dhufsaueyaasha iyo isirada taas oo ardaydu ka heleen fasaladii hore iyo inay la qabsadaan ardaydu macnaha (Naxurke) u qeybsanaanta.

Dhiirigalin: hawlagalka 2.4ee buugge Ardayga ayaa la isticmaali karaa. Marka laga fikirayo dejinta masalada ee hawlgalka 9dherer ka sanduuqu waa in uu noqdo dhufsane Ama u qeybsamo dhererke saabuunta),

Ardaydu waa inay Aqoon sadaan in su'aalaha u qeybsanaanta ay leeyihiin dabakhaad muliim ah, tau waxaa loo Samayn karaa si kooban ayadoo la isticmaalayo buugga Ardayga.

Ardaydu wey sii yaqaaneen Fikradaha iyo qaaciidooyinka dhufsaneyaasha iyo isirada fasaladii hoose. Sidaas darted 2.2.1 Nakhtiinka dhu Fsaneyaasha iyo qeybsheyaashu (Buugga Ardayga) waxaa loo isticmaali karaa xoooj in la xoojinayo Aqoonta iyo Awooda Ama kartida ay u leeyiliiu Dhursaneyaasha iyo isiradai taasoo ay Ardaydu heleen marhore.

Barayaashu waxay soo bandhigi karaan caddaymahan kala duwan ee soo socda eek u xusan buugga Ardayga (x waa dhufsane j) Waxa kale oo loo qori karaa "x waxay u qeybsantaa j" ama"j waa isirka x" Adigoo ku xidhaya caddaymahan, si kooban uga dooda

Tusaalaha 1^{aad} ee cinwan hoosaadka 2.2. ee soo socda ee buugga Ardayga Fasalka dhexdiisa, iyo su'aalaha 3^{aad} ilaa 6^{aad} ee layliska 2.2 (Buugga Ardyga) waxaa ardaydu kagaga shaqeyu karaau Afka, si ay u xoojiyaan Aqoontooda, qoraalka shaxda 3 ee soo socota.

Su'aalah 7 ilaa 12 ee layliska 2.2 waxaa loo siin karaa shaqo quri.

Waa Muhiim in la badalaa qaababka joogtada ah ee had iyo jeer looga hadlo Fikradaha (Dhufsanaha, isirka/qeybshaha, u qeybsamaha) sidoo kale waa in la bodalo qaabka loo dhigayo su'aalaha si ardyda looga caawiyo inay helaan fahau buuxa oo ku saabsan isku-xidhnaanta ka dhaxaysa fikradaha. Qiime aad u sareeya waa in la siiyo sababaha suurtogalka (macquulka) ah eek u saabsan Tusaalaha 1 (Buugga Ardayga)

Jawaabaha laylisyada cuttub-hoosaadka 2.2

Jawaabaha layliska 2.3

1. 42 waxay dhufsane u tahay 7 iyo 6-bawaayo $42 = 6 \times 7$ Ama $42 \div 6 = 7$ iyo $42 \div 7 = 6$, laakiin 42 uma aha dhufsane 5, waayo ma jirto tior idil oo marka lagu dhufto 5 inasiisa 42 ($5 \times 8 < 42 < 5 \times 9$).
2. b. Run, waayo $12 \div 2 = 6$ ama $2 \times 6 = 12$
   t. Run, waayo $18 \div 3 = 6$ ama $3 \times 6 = 35$
   j. Run, waayo $35 \div 5 = 7$ ama $5 \times 7 = 35$
   x. Run, waayo, $52 \div 4 = 13$ ama $4 \times 13 = 52$
   kh. Been, waayo, majirto tiro idil laasoo markaan ku dhufano 8 ina siisa 62 ($8 \times 7 < 62 < 8 \times 8$)
3. 24 waa dhufsane 4, waayo $24 \div 4 = 6$ ama $4 \times 6 = 24$
   t. 74 ma'aha dhufsane 4, waayo ma jirta tior idil, taasoo markaan ku dhufano 4 ina siisa
   74 ($4 \times 18 < 74 < 4 \times 19$)
   j. 100 waa dhufsane 4, waayo $100 \div 4 = 25$ Ama $4 \times 25 = 100$ Ama haddii tiro ku dhammaata laba eber wey u qeybsantaa 4.
4. b. Dhufsaneyaasha 3 ee u dhaxeeya 47 iyo 62 waa 48, 51, 54, 57 iyo 60
   t. Tirooyinka u dhaxeeya 35 iyo 47 kuwaasoo aan ahayn dhufsaneyaasha 3 waa 37, 38, 40, 41, 43, 44 ioy 46.
5.

b	42	28	9	14	27	0	1	13	0	2
t	7	6	0	14	3	18	9	1	0	12
12B miyey tahay dhufsane t	haa	maya	maya	haa	haa	haa	maya	haa	maya	maya

6. adigoo isticmaalaya 56, 42, 36, 81, 63, 87
   b. Dhufsaneyaasha 9 waa: 36, 81, 63
   t. ma'aha dhufsaneyaasha 9: 56, 42, 87
   j. Dhufsaneyaasha 7: 56, 42, 63
   x. Aan ahayn dhufsaneyaasha 7: 36, 81, 87
   kh Dhufsaneyaasha 9 iyo 7 labadaba ah: 63

7.

t	5	7	8	1	17	0	4	6	9	10
b	15	77	65	10	17	8	0	72	3	100
t isir miyey u tahay b	haa	haa	maya	haa	haa	maya	haa	haa	maya	haa

8. b. isirada 16: 1, 2, 4, 8, 16

   t. isirada 15: 1, 3, 5, 15
   j. isirada 18: 1, 2, 3, 6, 9, 18
   x. Isirada 55: 1, 5, 11, 55
   kh. Isirada 81: 1, 3, 9, 27, 81

   c. Isirada 23: 1, 23

9.

	x	y	x ÷ y	y ÷ x	y miyey tahay dhusane x?	x miyey tahay dhufsane y?
b	45	9	5	malaha xalin	maya	haa
t	80	4	20	malaha xalin	maya	haa
J	30	30	1	1	haa	haa
x	12	0	malaha xalin	0	haa	maya

2.2.2 Tirooyinka Mutuxan iyo Kuwa Farcan iyo Isiraynta

Inagoo ku xidhayna hordhaca “tiroyyinka Mutuxan” iyo “kuwa farcan” Ardydu Waxay noqon ku wo Aqoon u leh Fikrada Qeexid xisaabeedka muliimka ah. Waa inay ahaadaan kuwo awoodi kara inay bixiyaau qeexida tirooyinka Mutuxan iyo inay u isireeyaan tirooyinka Farcan isiro mutuxan (ama qeybsheyaal).

Tau waxaa loo qqbau doonaa sidan soo socota:-

Xiisada 1^{aad} waxaa loo isticmaali sidan soo socota:-

1. Hubin la hubiyo heerka laga bilaabayo, ku qor weedhahan Ama howraarahan soo socda ama kuwo la mid ah sabuurada:
   b. 7 waa iskirka 21 t. 8 waa isirka 51
   j. 1 waa isirka 27 x. 9 waa isirka 9
   Dabadeed waydii Ardayda in ay go’aami yaau in weedhuhu ay run yihiin iy in kale hana sababeeyaan markasta (su’aalo afka ah).
2. Si looga shaqeeyo fikradaha tirooyinka Mufaxan: ku hanuuni Ardayda iu ujeedadu tahay in la raadiyo dhammaan isirada/qeybsheyaasha tirade idil ee lagu siiyey. ee “xidigta – isirka” (shaxanka 2.1 ee buugga Ardayga) Waxaa loo isticmaali karaa iu lagu raadiyo dhemmaan isirada (ama qeybshe – yaasha) tiro si habaysan.
   “xiddigta – isirka” waxaa kale oo loo isticmaali karaa in lagu kiciyo xiisaynta ardayga iyo in lagu dardar galiyo shaqada, Adigoo la shaqeynaya Ardayda,

Raadi Dhammaan isirada tiro idil oo lagu siiyey (Tusaale ahaan, Tirooyinka 20 iyo 18). Raaci, dood ku saabsan tirade isir ee tiro idili lahaan karta.
Tusaalahan soo socdaa (Ama hawlgalka 2.5 ee Buugga Ardayga) waxaa loo isticmaali karaa Arintan (ujeedadan).
[ogow in jog – taxa 3aad ee shaxdan soo socota aytahay in lagu buuxiyo (dhamaystiro) xaraf).

Jawaabaha hawlgalka 2.5

tiro	isir	tirada isirada
1	1	1
2	1, 2	2
3	1, 3	2
4	1, 2, 4	3
5	1, 5	2
6	1, 2, 3, 6	4
7	1, 7	2
8	1, 2, 4, 8	4
9	1, 3, 9	3
10	1, 2, 5, 10	4
11	1, 11	2
12	1, 2, 3, 4, 6, 12	6

U tilmaan Ardyda si ay u sameeyaan Aqoonsiyadan soo socda ee ay ka heleen shaxda sare.

- Tirada 1 waxay leedahay hal isir oo kaliya, lana dhaho 1.
- Waxaa jira tirooyin leh laba isir oo kaliya, ahna 1 iyo iyada lafteeda.
- Waxaa jira tirooyin leh in ka badan laba Isir/qeybsheyaal.
- Eber wuxuu leeyahay isiro/qeybsheyaal aan la qiyaasi kari (xadlahayn).

Hadda Adigoo isticmaalaya Tusaalaha 2aad ee qeybta 2.2.2 ee soo socda (Buugga Ardayga), kala – jajabinta (Isiraynta) tirooyinka idil waa laga shaqeyn karaa.

Ka caawi ardayda in ay Aqoonsadaan Aqoonsiyadan soo socda ee laga helay Tusaalaha 2aad.

- Tiro kasta oo idil waxaa loo qori karaa taranta Isirada: (Tusaale:- 12, 5, 1, 0)
- Waxaa jira tirooyin leh laba Isir oo kaliya (Tusaale, 5)
- Tiro kasta, taas oo u qormi karta taranta laba Isir, laba Ama in ka badan oo jid (Tusaale, 12) waxay u qormi kartaa taranta isirada taas oo aan la sii kala jajabin Karin ($12 = 2 \times 2 \times 3$)

Waa muhiim in tixgalin (Muhimada) dheeraad ah la siiyo tirooyinka aau la sii kala jajabin Karin (marka laga reebo eber iyo hal), Taasi waxay tahay tirooyinka ka weyu 1 ee leh laba isir, hal iyo iyada lafteeda.

Tirooyinkani waa qeybaha xubnaha isku – dhufashada eek ala jajabinta (isir'ayuta) tiro idil oo kasta.

Hadda Waad bari kartaa fikradaha Ama Macnaha "Tiro mutuxan" iyo "tiro farcan", dabadeed joogtaxa 3^{aad} ee shaxda sare waa la dhammaystiri karaa. Sidoo kale waa Muhiim

In loo sheego Ardyda in tirooyinka idil ee 0 iyo 1 aanay ahayn tiro Mutuxan iyo tiro farcan midna.

3. Ugu dambeyntii, fikraadaha cusubi wey ka dhaadheceen ayadoo loo isticmaalay laylisyo (tusaale ahaan, Ayadoo la isticmaalayo su'aalaha 1, 2 iyo 3 ee layliska 2.3 buugga Ardayga).

Xiisada 2aad Waxaa loo Isticmaali Karaa Sidan Soo Socota

1. Nakhtiin gaaban oo ku saabsan tiro Mutuxan iyo tu Farcan. Arintan waxad u isticmaali kartaa su'aalaha 5 iyo 7 ee layliska 2.3.
2. Laylisyo ku saabsan isiraynta mutuxan: halkan Muhiimadu waa inay noqoto sidii looga dhaadhicin lahaa habka isiraynta iyo sidii kor loogu qaadi lahaa xirfada xisaabinta ee Ardyda. Lagama maarmaanimada laylisyadani waa si loogu dardar-galiyo Ardyda isticmaalka isiraynta Mutuxan si loo raadiyo isirada ay wadaagaan iyo dhufsaneyaasha ay wadaagaan kuwaas oo lagaga hadli doono casharka soo socda. Habka isiraynta mutuxan waxaa laynagu siiyey tusaalaha 4^{aad} eek u xiga Qeexida 2.1 (ee Buugga Ardyga), tani Waxaa loo isticmaali si joogto ah.

   Isticmalaka Astaanta jibbaarku si loo qoro isirada mutuxan waa hab kooban waana la bari, waxaana Ardayda lagu dhiirigalin in ay isticmaalaan (tani waxaa lagu samayn tiro la mid ah ta lagugu siiyey Tusaalaha 4 ee buugga Ardayga, ee ka horeeya uun layliska 2.4)

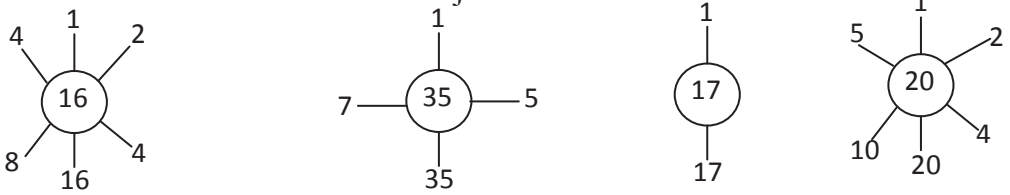
   Laylis ahaan/Gacau ka qabasho, su'aasha 4 ee layliska 2.3 (Buugga Ardayga) ayaa loo isticmaali karaa. Ugu dambeyntii, Fikradaha macnaha tiro mutuxan waxaa lagu caddeeyey Qeexida (Qeexida 2.1)

Jawaabaha hawlgalka 2.6

Tiro	U qeybsama	Tiro	U qeybsama	Tiro	U qeybsanaanta
1	1	6	1, 2, 3, 6	16	1, 2, 3, 4, 8, 16
2	1, 2	7	1, 7	17	1, 17
3	1, 3	8	1, 2, 4, 8	18	1, 2, 3, 6, 9, 18
4	1, 2, 4	9	1, 3, 9	19	1, 19
5	1, 5	10	1, 2, 5, 10	20	1, 2, 4, 5, 10, 20

Jawaabaha layliska 2.4

1. b. t. j. x.



2. b. Run; $1 \times 1 = 1$

   t. Been, sabatoo ah tiro idil oo kasta kana wayn 1, waxay leedahay labo isir, hal iyo tirade qudhigeeda

   j. Been, waayo waxaan ka ahayn hal waxay leeyihiin labo isir.

3. 7, 17, 31, 83, 19, 29, 43, 73, 61, 87
4. 17, 19, 23, 29, 31, 37, 41, 43, 47
5. B. Isirada 9: 1, 3, 9 t. Isirada 19: 1, 19
   j. Isirada 90: 1, 2, 3, 5, 9, 15, 18, 30, 45, 90
   x. Isirada 60: 1, 2, 3, 4, 5, 12, 15, 20, 30, 60
6. Mutuxan: b, x, d, sh
   Farcau: b, j, s, dh
   Aan mutuxana ahayn farcana ahayn: kh, r
7. b. $25 = 5 \times 5 = 5^2$
   t. $36 = 2 \times 2 \times 3 \times 3 = 2^2 \times 3^2$
   j. $80 = 2 \times 2 \times 2 \times 2 \times 5 = 2^4 \times 5$
   x. $72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$
   kh. $117 = 3 \times 3 \times 13 = 3^2 \times 13$
8. b. $18 = 2 \times 3 \times 3 = 2 \times 3^2$ t. $21 = 3 \times 7$
   j. $32 = 2 \times 2 \times 2 \times 2 \times 2 = 2^5$ x. $40 = 2 \times 2 \times 2 \times 5 = 2^3 \times 5$
   kh. $48 = 2 \times 2 \times 2 \times 2 \times 3 = 2^4 \times 3$ d. $72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$
   r. $81 = 3 \times 3 \times 3 \times 3 = 3^4$ s. $100 = 2 \times 2 \times 5 \times 5 = 2^2 \times 5^2$

2.2.3 Isirada ay Wadaagaan

1. U bar fikradaha cusub sidan soo socota:-

Marka 1aad ugu celi sida loo raadiyo Isirada tiro idil oo lagu siiyey si ay uga caawiso Ardayda inay xasuustaan Waxay horey u soo barteen. Tusaalaha 5aad ee ku xiga 2, 2, 3 ee buugga Ardyga waa loo isticmaali karaa Arintan, dabadeed, qaado laba tiro oo idil (Tusaale ahaan, tirooyinka 36 iyo 60), isireena midkasta (fiiri buugga Ardayga).

d. Aqoonsiyo:- isir kastaa waa qeybshaha Tirada

r. Dhammaan isirada/qeybsheyaasha tiro waxay u taagan yiliin urur.

s. Haddii uu jiro isir ay wadaagaan oo ku jira ururka isirada laba tirooyin, wuxuu u taagan yahay Isirka/qeybshaha ay wadaagaan labada tirooyin.

Sh. Ugu dambayntii, Fikradaha waxaa la bari ayadoo la isticmaalayo

Tusaaleyaal (sida: Tusaalaha 6aad iyo ka Horeeya) sida ka Muuqata Buugga Ardyga, Ayadoon la isticmaaleyn habka isirayuta Mutuxan, Gaar ahaan heerka bilowga. Dabcan, isiraynta mutuxan sidoo kale waa la isticmaali karaa. Laakiin waayo – aragnimooyin dhab ah ayaa waxay in a tuseen in ardydu ay dhibaato kala kulmeen isticmaalka Isiraynta mutuxan bilowga, waayo? Waxay isku – qasaan Arintan iyo raadinta dhufsaneyaasha.

Dh. Fikrada Isirweynaha ay wadaagaan (IWW) iyo Qeexida labada tiro Ama inta ka badan ee isirada ay wadaagaan yihiin hal (Qeexida 2.2 ee buugga Ardayga) waxay wax ka tari xidhiidhka Isirada ay wadaagaan

2. laylisyada loo isticmaalo Raadinta/go'aaminta IWW tirooyin idil waxaa lagugu siiyey layliska 2.5 (Buugga Ardayga).

Jawaabaha layliska 2.5

1. b. Isirada 21: 1, 3, 7, 21
Isirada 28, 1, 2, 4, 7, 14, 28
Isirada ay wadaagaan 21 iyo 28 waa 1, 7, hadaba IWW 21 iyo 28 waa 7
Adigoo isticmaalaya isiraynta mutuxan:
$21 = 3 \times 7$
$28 = 2^2 \times 7$
IWW (21, 28) = 7

t. Isirada 24: 1, 2, 3, 4, 6, 8, 12, 24
Isirada 48: 1, 2, 3, 4, 6, 8, 12, 24, 48
Isirada ay wadaagaan 24 iyo 48 waa:-
1, 2, 3, 4, 6, 8, 12, 24
Hadaba, IWW 24 iyo 48 waa 24
Adigoo isticmaalaya Isiraynta

Mutuxan:

$24 = 2^3 \times 3$

$48 = 2^4 \times 3$

IWW $(24, 48) = 2^3 \times 3 = 24$

j. Isirada 63: 1, 3, 7, 9, 21, 63

Isirada 84: 1, 2, 3, 4, 6, 7, 8, 12, 14, 21, 28, 42, 84

Isirada ay wadaagaan 63 iyo 84 waa 1, 3, 7, 21

Hadaba, IWW 63 iyo 84 waa 21.

Adigoo isticmaalaya Isiraynta mutuxan

$63 = 3^2 \times 7$

$84 = 2^2 \times 3 \times 7$

IWW $(63, 84) = 3 \times 7 = 21$

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

Isirada 80: 1, 2, 4, 5, 8, 10, 16, 20, 40, 80

Isirada ay wadaagaan 60 iyo 80 waa 1, 2, 4, 5, 10, 20

Hadaba, IWW 60 iyo 80 waa 20.

Adigoo isticmaalaya Isiraynta mutuxan

$60 = 2^2 \times 3 \times 5$

$80 = 2^4 \times 5$

IWW $(60, 80) = 2^2 \times 5 = 20$

2. Waad isticmaali kartaa habkasta oo ka mid ah hababka loo isticmaalay su'aasha 1^{aad} ee xaggga sare. Si aan ugu guuleysano,

Waxaan isticmaali doonaa habka isiraguta mutuxan si aan ugu jawaabno su'aashan

b. $24 = 2^2 \times 3$

$36 = 2^2 \times 3^2$

$42 = 2 \times 3 \times 7$

Hadaba, IWW $(24, 36, 42) = 2 \times 3 = 6$

t. $36 = 2^2 \times 3^2$

$15 = 3 \times 5$

$45 = 3^2 \times 5$

Hadaba, IWW $(36, 15, 45) = 3$

j. $35 = 5 \times 7$

$49 = 7^2$

$84 = 2^2 \times 3 \times 7$

Hadaba, IWW $(35, 49, 84) = 7$

x. $36 = 2^2 \times 3^2$

$72 = 2^3 \times 3^2$

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

Hadaba, IWW (36, 72, 90) = $2 \times 3^2 = 18$

3. Jawaabta suurtogaka ahi waa 5, 10 iyo 25

Hadaba, 12 iyo 15 malaha xidhiidh mutuxan, waayo waxay leeyihiin isir ay wadaagaan (3) oo aan ahayn 1.

2.2.4 Dhufsaneyaasha ay Wadaagaan

Cinwaankan/ Aqoontii ardyda eek u saabsanayd dhufsaneyaashu waxay u sii fidi heerka raadinta dhufsaneyaasha ay wadaagaan laba Ama seddex tiro idil oo ka kooban ha lama laba god. Fikrada Muhiimka ah ee "dhufsaneyaraha ay wadaagaan" (dh.y.w) waa lagu baran iyo waliba habka raadinta/go'aaminta Dhufsaneyaraha ay wadaagaan waa in lagaga shaqeeyo. Ardaydu waa in ay awoodi karaan in ay raadiyaan Dh. y.w laba Ama seddex tiro oo idil ayagoo isticmaalaya Tusaaleyaal fudud.

Geedi Socodkan Soo Socda ayaa la doorbiday

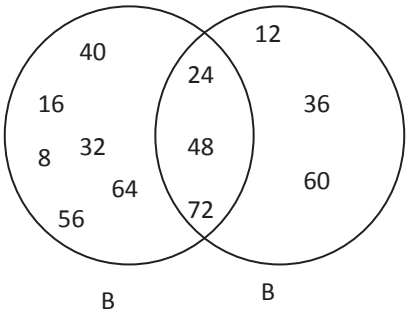
1. Furfurida fikradaha dhufsaneyaasha ay wadaagaan iyo Qeexida Dhufsanegaraha ay wadaagaan.

   Tusaalaha 8^{aad} ee raaca qeexida 2.3(Buugga Ardayga) Waxaa loo isticmaali karaa dardar – galin iyo Nakhtiin la Nakhtiimo Dhufsaneyaasha tirooyinka Idil, Dabadeed adigoo isticmaalaya Tusaaleyaasha 9^{aad} iyo 10^{aad} Ardayga, waxaad sharixi/ka hadli Macnaha Dhufsanaha ay wadaagaan iyo dhufsaneyaraha ay wadaagaanu iyo in la tuso sida loo raadiyo dhufsaneyaraha ay wadaagganlaba Ama seddex tiro oo idil oo ka kooban laba ama hal god ayadoo la taxayo qaar ka mid ah dhufsaneyaasha tiro kasta. Ayadoo tan lagu xidhayo, waxaa kale oo aad tusi kartaa in midka ugu yar dhufsaneyaashan ay wadaagaan uu yahay dhufsaneyaraha ay wadaagaan (Dh.y.w) tirooyinka lagu siiyey.

   Bartani, Waxa muhiim ah in loo caddeeyo Ardayda in dh.y.w aanu ahayn eber, sidaas awgeed eber waa laga reebi marka la taxayo si loo helo dh'y.w. waxa kale oo loo baahan yahay in ardayda lagu Wargaliyo in uu tiro hal tiro kaluja oo ah (dh.y.w).

   - Wey haboontahay in la isticmaalaa jaantuska Feen si loo muuj iyo isu – xidhnaanta ka dhaxaysa ururada dhufsaneyaasha ee tirooyinka.

Qoraalka tirooyinka Waxaa samyn Ardyda



2. Si aad loogaga dhaadhiciyo fikradihii la baray, Ardyda waa in la weydiiyo inay sameeyaan shax kele oo ay ku qoran yihiin Dhufsaneyaasha iyo dhufsaneyaasha ay wadaagaan laba tiro sida mida lagugu siiyey buugga Ardayga, kana dooda su'aasha 7^{aad} ee layliska 2.6 (Buugga Ardyga).
3. Ka shaqeynta habka lagu raadiyo/go'aamiyo dh'y.w adigoo isticmaalaya isiraynta mutuxan

   Go'aaminta dh.y.w laba ama seddex tiro Adigoo taxaya dhammaan dhufsaneyaasha tirooyinka ilaa laga gaadhayo dh.y.w Waxaa lagu bedelay hadda habab kale oo lakabyo ah.

   Habkan waxaa lagu tusi karaa Adigoo isticmaalaya Tusaaleyaasha 14 iyo 15 ee ku qoran layliska 2.6 (Buugga Ardyga) hortiisa (halka ka loreysa) si isdabajoog ah waxoogaa su'aalo ah (Tusaale ahaan, 8b, 8d ee layliska 2.6) ayaa loo baahan yahay in loo diro lagagana dodo fasalka dhexdiisa.

   [OGow: Jidka kaliya ee ugu fududi wuxuu noqon in loo hubiyo si isdabajoog ah, haddii tirooyinka ugu yari ay yihiin qeybshaha dhufsaneyaasha ka labaad ilaa aad helaysid hawraar run ah. Tusaale ahaan, raadinta dh.y.w 15 iyo 20, weydii haddii 15 ay tahay qeybshaha 20? Ka 40? Ka 60? Iyo sidoo kale ilaa aad gaadhid Jawaabta saxda ah. Xaaladan waxaan ognahay in 15 aanay ahayn qeybshaha 20 iyo 40 midna, laakiin ay tahay qeybshaha 60. Hadaba 60 waa dhufsaneyaraha ay wadaagaan 15 iyo 20, maadaama oo aanu jirin tiro ka yar 60 taasoo dhufsane u ah 15 iyo 20 – ba].

   Markaad hubisid in ardaydu ay fahmeen habka dabadeed, waxogaa Astaamo dh.y.w ah waa in laga shaqeeyaa si loogu fududeeyo. Arintan, waxaad u isticmaali kartaa masalooyinkani soo socda ee laguudiray.

   - Raadi dh.y.w b) 10 iyo 15 t) 4 iyo 5 j) 6 iyo 18

   Aqoonsiyadani soo socdaa waa inay ku siiyaan:-

Haddii b iyo t ay yihiin tirooyin idil oo b < t, dabadeed dh.y.w waa:-

i) Waa tirada weyn ee t haddii b tahay qeybsheha t --- (sida J)
ii) Taranta b × t haddii b iyo t ay wadaagaan 1 kaliya --- (sida t)
iii) Tiro u dhaxaysa t iyo b × t (xaaladaha hadhay oo dhan --- (sida b)

4. Sii gudogalka habka Raadinta dh.y.w:

c. Go'aaminta dhufsaneyaraha ay wadaagaan laba tiro oo idil oo ka kooban hal ama laba god waa in la tixgaliyo Ardydu waa inay horumariyaan xirfadahooda xisaabinta Degdega ah iyo xaqiijinta Raadinta hooseeye – yaraha ay wadaagaan (HYW) xiisadaha soo socda ama dambe – sida:-

Markaan ka hadlayno jajabyada, Waxyaalo badan oo gacanta laga qabto, su'aalaha 8 ee layliska 2.6 waa loo diri karaa.

k. Dhammaad, waad tusi kartaa sida loo go'aamiyo ama Raadiyo dh.y.w seddex tirooyin adigoo isticmaalaya Tusaalaha Su.aasha 8^{aad} ee layliska 2.6 waxaa loogu diri karaa inay gacanta kaga shaqeeyaan/ayna ku dabakhaan waxay soo barteeu ee laga sugayo.

Jawaabaha Layliska 2.6

1. b. $56 = 2^3 \times 7$ t. $84 = 2^2 \times 3 \times 7$
j. $72 = 2^2 \times 3^2$
x. $210 = 2 \times 3 \times 5 \times 7$ kh. $306 = 2 \times 3^2 \times 17$
D. $150 = 2 \times 3 \times 5^2$ r. $510 = 2 \times 3 \times 5 \times 17$
s) $330 = 2 \times 3 \times 5 \times 11$ sh) $252 = 2^2 \times 3^2 \times 7$
dh) $126 = 2 \times 3^2 \times 7$

2. b. $21 = 3 \times 7$
$28 = 2^2 \times 7$
IWW (21, 28) = 7
t. $68 = 2^2 \times 17$
$102 = 2 \times 3 \times 17$
IWW (68, 102) = 2×17 ama 34
j. $60 = 2^2 \times 3 \times 5$
$80 = 2^4 \times 5$
IWW (60, 80) = $2^2 \times 5 = 20$
x. $27 = 3^3$ kh. (63, 84)
$54 = 2 \times 3^3$
IWW (27, 54) = $3^3 = 27$

3. b. $24 = 2^3 \times 3$
$36 = 2^2 \times 3^2$
$42 = 2 \times 3 \times 7$
IWW (24, 36, 42) = 2×3 ama 6

t. $35 = 5 \times 7$
$49 = 7^2$
$84 = 2^2 \times 3 \times 7$
IWW (35, 49, 84) = 7

j. $45 = 3^2 \times 5$
$105 = 3 \times 5 \times 7$
$75 = 3 \times 5^2$
IWW (45, 105, 75) = 3×5 Ama 15

x. $90 = 2 \times 3^2 \times 5$
$252 = 2^2 \times 3^2 \times 7$
$630 = 2 \times 3^2 \times 5 \times 7$
IWW (90, 252, 630) = 2

4. IWW $2 \times 3^2 \times 5^2$ iyo $2^3 \times 3 \times 5^2$ Ama 150
5. Ayadoo la eegayo haddii wadarta godadka ee tiro kastaa ay u qeybsamayso 3.
6. Hal Jawaab oo suurto – gal ahi waa 15, 70 iyo 110.
7. b. $12 = 2^2 \times 3$
$16 = 2^4$
Dh.y.w (12, 16) = $2^4 \times 3$ Ama 48

t. $20 = 2^2 \times 5$
$50 = 2 \times 5^2$
Dhyw (20, 50) = $2^2 \times 5^2$ Ama 100

j. $16 = 2^4$
$24 = 2^3 \times 3$
Dhyw (16, 24) = $2^4 \times 3$ Ama 48

x. $15 = 3 \times 5$
$18 = 2 \times 3^2$
Dhyw (15, 18) = $2 \times 3^2 \times 5$ Ama 90

8. b. $2 = 2$
$7 = 7$
$8 = 2^3$
Dhyw (2, 7, 8) = $2^3 \times 7$ ama 56

t. $8 = 2^3$
$28 = 2 \times 7^2$
$30 = 2 \times 3 \times 5$
Dh.y.w (8, 28, 30) = $2^3 \times 7 \times 3 \times 5 = 840$

j. $35 = 5 \times 7$
$25 = 5^2$
$49 = 7^2$
Dh.y.w (35, 25, 49) = $5^2 \times 7^2$ ama 1225

x. $68 = 2^2 \times 17$
$170 = 2 \times 5 \times 17$
$4 = 2^2$
Dh.y.w (68, 170, 4) = $2^2 \times 5 \times 17$ ama 340

9. Dh.y.w wuxuu noqonayaa labada tiro ta weyn, haddii tirada weyni ay tahay dhufsanaha tirada yar ama tirada yari ay tahay isirka Tirada weyn.
10. Haddii tirooyinku aanay lahayn isir ay wadaagaan oo hal ka duwan (xidhiidhkoodu uu mutuxan yahay).
11. $72 = 2^3 \times 3^2$

    $54 = 2 \times 3^3$

    IWW $(72, 54) = 2 \times 3^2 = 18$

    b. dhererka ugu dheer ee suurtogalak ah ee khaanadu hu waa 18 iinj.
    t. Sacaada waxay lahaan doontaa 7 khaanadood oo midiiba dhererkeedu yahay 18 iinj, ballaceeduna yahay 1 iinj (waayo, $72 = 18 \times 4$ iyo $54 = 18 \times 3$)

12. Dhufsaneyaasha 12 waa 0, 12, 24, 36, 48, 60, 72, 84, 96, 108, …

    Dhufsaneyaasha 18 waa 0, 18, 36, 54, 72, 90, 108, 126, ….

    Dhufsaneyaasha ay wadaagaan 12 iyo 18 waa:-

    0, 36, 72, 108, ….

    Dhyw 12 iyo 18 waa 36

    Ama

    $12 = 2 \times 2 \times 3$

    $18 = 2 \times 3 \times 3$

    Dh.y.w 12 iyo 18 waa $2 \times 3 \times 2 \times 3 = 36$

    Hadaba, labada bas mar labaad waxay kulmi doonaan 36 miridh ka dib.

13. Dhufsaneyaasha 6 waa:-

    0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, …

    Dhufsane yaasha 9 waa:

    0, 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99, 108, 117, 126, …

    Dhufsaneyaasha 12 waa:-

    0, 12, 24, 36, 48, 60, 72, 84, 96, 108, ….

Dhufsaneyaasha ay wadaagaan 12 iyo 18 waa:- 0, 36, 72, 108

Dh.y.w 6, 9 iyo 12 waa 36

Ama

$6 = 2 \times 3$

$9 = 3 \times 3$

$12 = 2 \times 2 \times 3$

Dh.y.w 6, 9 iyo 12 waa

$2 \times 2 \times 3 \times 3$ ama 36

Haddaba, seddexda jalas waxay garaacmi doonaan hal mar 36 miridh ka dib

Jawaabaha Layliska Nakhtiinka Cuttubka 2aad

1. 15, 30, 45, 60
2. b) i) 1, 3, 9 ii) 1, 13
   t) 1, 3, 13
3. b) Been t) Run j) Run x) Been
4. 23 iyo 29
5. b) Run, waayo 12 + 36 waa 48, weyna u qeybsantaa 2.
   t) Run, waayo taranta 14 iyo 28 waa 392. 392-na wey qeybsantaa 7.
6. b) i) wey qeybsanta 4
   ii) uma qeybsamo 4
   t) haddii tirada labadeeda god ee u dambeeyaa u qeybsanto 4, dabadeed tiradu wey u qeybsantaa 4.
7. b) $42 = 2 \times 3 \times 7$
   t) $24 = 2 \times 2 \times 2 \times 3 = 2^3 \times 3$
8. b) 4 t) 1
9. b) 36 t) 48 j) 15

CUTTUB 3 JAJABYADA IYO JAJAB TOBAN LAYAASHA

Inta xiisadood Ee loo qoondeeyay 41

HODHAC

Muhimada ugu weyn ee cutubkani waa in la ballaadhiyo lana xoojiyo aqoonta iyo Awooda Ardayda ee ku saabsan fikradaha aasaasiga ah ee jajabyada iyo jajab tobanlayaasha. Cutubkani wuxuu u qaybsamaa shan ciwaan, kuwaas oo u sii qaybsama ciwaan hoosaado, ciwaan hoosaadada cutubkani waa fududaynta jajabyada, isku badalka jajabyada iyo jaja-tobanleyaasha.

Isku badelka jajabyada iyo boqolayda, isbarbar dhiga iyo u qorista siday u kala horeeyaan u qorista jajabyada iyo jajab tobanlayaasha, isku dhufashada iyo usku-qaybinta jajabyada iyo jajab tobanlayaasha.

Ujeedooyinka Cuttubka

Cutubkani marka uu dhamaado dabadeed ardaydu waxay awoodi doonaan in ay:

- *Fududeeyaan jajabyada heerka sareeyaha iyo hooseeyaha isir-waynaha ay wadaagaan yahay hal.*
- *Fahmaan jajabyada iyo jajab tobanlayaasha aanay xaqiijiyaan in tiro loo qori karo laba hab midkood isla tiro kaliya.*
- *Horumariyaan xirfadooda isbar-bar dhiga iyo u qorida siday u kala horeeyaan jajabyadu.*
- *Horumariyaan xirfadooda isugaynta, kalagoynta, isku-dhufashada iyo isku-qaybinta jajabyada iyo jajab toaban layaasha.*
- *Ka shaqee masalooyinka u taagan jajabyada iyo jajablayaasha.*

Kaabayaasha loo doorbiday cutubka 3aad

Buugga ardayga iyo tilmaame baraha ma'aha eh waxaa kale oo lagugula taliyay in aad diyaariso oo aad fasalka keento Alaabahan (qalabkan) soo socda, markaa cutubku u baahdo. Goobo ka samaysan kartoon, taasoo loo qaybiyay qaybo badan oo isleeg oo qaybo ka mid ahi ay hadhaysan yihiin, midabo, mastarad, sabuurad ama tabeele u samaysan kartoon sida laydiga oo ka samaysan kartoon loona qaybiyay qaybo badan oo isleeg oo qaar ka mid ahi ay hadhaysan yihiin iyo tabeelo jajabyo midabaysan.

3.1 FUDUDAYNTA JAJABYADA

Waqtiga loo qoondeeyay: 5 xiisadood

Waxa ardayga laga rabo dhammaadka cutubkani

Ardaydu waxay awoodi doonaan in ay:

- *Jajabyada u yareeyaan heerka u hooseeya ee ay u qori karaan.*
- *Bixiyaan jajabyada isku midka ah*

Erayo Cusub

- jajab, isku mid ah, jajabyo, heerka u hooseeya ee jajab loo qoro.

Hordhac

Muhiimahada ugu way nee cutub hoosaadkani waa in ardaydu ay la qabsadaan fududaynta jajabyada iyo jajabyada isku midka ah ama isku dhigma.

Gudbinta Cashirka

Ciwaankani wuxuu ka hadlayaa fududaynta jajabyada, ciwaankani wuxuu inoo sharxayaa ama ina tusinayaa asagoo bayaaminaya asagoo ina tusinay tusaalayaashan ka sheekaynaya fikradaha muhiimka u ah gudbinta cashirkan.

B. jajab

Ku bilaw shaqo kooxeedka 3.1 (ujeedada shaqo kooxeedka waa in la siiyo macnaha dhabta ah ee jajab, taas oo ardayuda ku hogaamin doonta qeexida jajab). Ardaydaada waa inaad u sheegto in ay fasalka la yimaadaan xabbad liin ah (koox kasta oo ka kooban afar xabad liin ah). Ha wadaan in waxoogaa ah

shaqo kooxeeda shan ilaa 10 miridh, ku wareeg fasalka adigoo ardayda ku dhiiri galinaya in ay ka qayb galaan shaqo kooxeedka. Koox kasta mid.

Matalayaan ha soo Jeediyo, hubi in arday kastaa ka shaqeeyay hawlgalka. Hadda adiga laftigaagu ugu shaqee ardayda hawlgalka marka laga hedlo hawlgalka 3.1 ka dib, ardaydu ha akhriyaan qeexida 3.2, sii sharaxaad badan tus qeexida adigoo isticmaalaya tusaalayaasha qeexida halka ku xigta lagugu siiyay.

Bar ardayda qeexida jajabyada isku- dhigma ardaydu ha bixiyaan tusaalayaal jajabyo isku dhigma ah, markaad ka hadasho (aad siiso) labadaas tusaale waxaad siin kartaa shaqo fasal ardayda.

Qiimayn

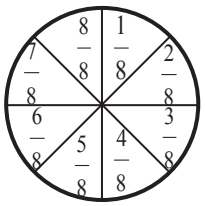
Qiimaynta dabadeed ee ka qaybgalka shaqo kooxeedka, hawlgalka, shaqada fasalka, laylisyada, laylisyada 5.1.

Shaqo Fasal: (waxaad siin kartaa su'aalo adigu aad samaysay).

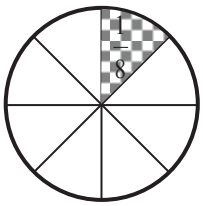
1. U qor jajabka 32/20 heerkiisa ugu hooseeya.
2. Bixi ama keen hal tusaale oo u dhigma 2/3.
3. Bixi ama keen laba tusaale oo la mid ah ama u dhigma 3/5.

Jawaabaha shaqo kooxeedka 3.1

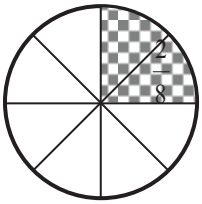
1. b. qaybta saaxiibkaa waa qayb_____ .
   t. qaybta ku soo hagaagta mid kasta oo ka mid ah saaxiibadaa ma'aha 1, laakiin waa hal-afreedka wadarta.
   j. $\frac{1}{4}$
2. b. jaantuska 3.1 waxa uu u qaybsan yahay siddeed waaxood oo isle'eg.
   t.



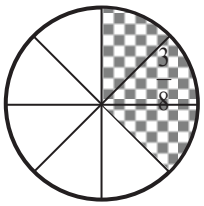
j.



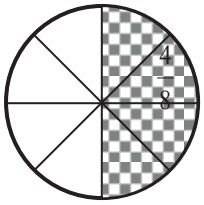
x.



kh.



d.



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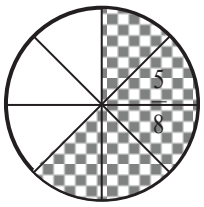

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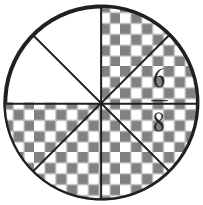
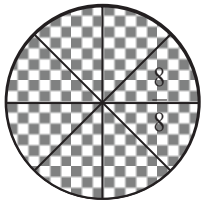


sh.



dh. Markaan dib u eegay tallaabooyinka ‘r’ iyo “s” hawshi aan ka soo qabtay, waxaan arkay in ay isle’eg yihiin $\frac{6}{8}$ iyo $\frac{3}{4}$

Jawaabaha Hawlgalka 3.1

b. isirada 6 waa: 1, 2, 3, 6.

Isirada 8 waa : 1, 2, 4, 8.
Isirada ay wadaagaan 6 iyo 8 waa 1, 2
Isirka ugu wayn isiradan ay wadaagaan waa 2.
Haddaba IWM (6, 8) = 2.

t. jajabka 6/8, sareeyihiisu waa 6, haddii 6 aad u qaybiso 2 maxsuulku waa 3.

j. hooseeyaha jajabku waa 8, haddii8 aad u qaybiso 2 maxsuulku waa 4.

x. jajabka cusub ee aan heelay waa ¾, IWM, sarreeyaha iyo hooseeyaha jajabka cusubi waa 1.

Kh. waa isku mid ¾ = 6/8, waxaana lagu magacaabaa jajabyo isku dhigma (ama isku mid ah).

d. haa

sii jajabka a/b, b≠a.

talaabada 1^{aad}: raadi IWM (a, b)
talaabada 2^{aad}:u qaybi a isir waynaha ay wadaagaan (a, b)
talaabada 3^{aad}: u qaybi b IWM (a, b).
talaabada 4^{aad}:samee (qaabee) jajabka cusub adigoo sareeye u isticmaalaya tirada aad ka heshay talaabada 2^{aad}, tirada aad ka heshay talaabada 3^{aad}na u qaado hooseeye.

Jawaabaha Layliska 3.1

1. b. 8/10
talaabada **1^{aad}:** IWM (8,10) =2
Talaabada 2^{aad}: 8 u qaybi 2 waxaad heli 4
Talaabada 3^{aad}: 10 u qaybi 2 waxaad heli 5
Talaabada 4^{aad}: jajabka cusubi waa 4/5, waxaana loo fududeeyay heerkiisa u hooseeya.
8/10 = 4/5.

t. 14/12
talaabada 1^{aad}: IWM (14, 12) = 2
talaabada 2^{aad}: 14 u qaybi 2 waxaad heli 7
talaabada 3^{aad}: 12 u qaybi 2 waxaad heli 6
taalabada 4^{aad}: jajabka cusubi waa 7/6.
:- 14/12 = 7/6.

j. 18/24, IWM (18, 24)

heerka u hooseeya ee 18/24 = ¾.

x. 48/60

taalabada 1^{aad}: IWM (48, 60)= 12
talaabada 2^{aad}: 48 u qaybi 12, waxaad heli 4
talaabada 3^{aad}: 60 u qaybi 12, waxaad heli 5
talaabada 4^{aad}: jajabka cusubi waa 4/5.
:- 48/60 = 4/5

Kh. 24/18

Talaabada 1^{aad}: IWM (24, 18) =6
Talaabada 2^{aad}: 24 u qaybi 6, waxaad heli 4
Talaabada 3^{aad}: 18 u qaybi 6, waxaad heli 3
Talaabada 4^{aad}: jajabka cusubi waa 4/3.
:- 24/18 = 4/3.

d. 216/1080

talaabada 1^{aad}: maadaama 216 ay isir u tahay 1080, IWM (216, 1080) =216
talaabada 2^{aad}: 216 u qaybi 216, waxaad heli 1
talaabada 3^{aad}: 1080 u qaybi 216, waxaad heli 5
talaabada 4^{aad}: jajabka cusubi waa 1/5.
:- 216/1080 = 1/5.

r. 72/60

Talaabada 1^{aad}: IWM (72, 60) =12
Talaabada 2^{aad}: 72 u qaybi 12, waxaad heli 6
Talaabada 3^{aad}: 60 u qaybi 12, waxaad heli 5
Talaabada 4^{aad}: jajabka cusubi waa 6/5
Hadaba 72/60 = 6/5.

2. b. $\frac{6}{8}, \frac{9}{12}, \frac{12}{16}$ t. $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}$

3. b. IWM (2, 3) = 1 sidaas darteed 2/3 waa jajab u qoran heerkii u hooseeyay.
t. maadaama IWM (18, 24) = 6, 18/24 uma qorna heerkiisu u hooseeyay.
j. IWM (6, 7) =1 sidaas darteed 6/7 waa jajab u qoran heerkiisii ugu hooseeyay.
x. maadaama IWM (10, 20) =2, jajabka 10/20 uma qorna heerkiisii ugu hooseeyay.
Kh. IWM (5, 4) =1, sidaas darteed 5/4 waxay u qoran tahay heerkeedii u hooseeyay.
d. maadaama (6, 30) = 6, jajabka 6/30 uma qorna heerkiisii ugu hooseeyay.

3.2 ISKU-BADALKA JAJAB, JAJAB TOBANLE IYO BOQOLKIIBA

Xiisadaha loo Qoondeeyay: 10xiisadood

Waxa laga rabo ardayga in

- *uu jajab ka ubadalo jajab lobanle*
- *uu jajabka ubadalo boqolkiiba*
- *uu jajab tabanlaha ubadalo jajab*
- *uu boqolkiiba ubadalo jajab*
- *uu boqolkiiba ubadalo jajab tobanle*

Erayo Cusub

- Jajab toban layaasha dhammaada, jajab tobanlayaasha aan dhammaan, boqolkiiba, jajab qumane, jajab ma qumane, tiro dhafan.

Hordhac

Cutub hoosaadkani waxaad ku arki doonaa waxbarasho sa'id ah oo ku saabsan jajabyada, u badalida jajabyada loo badalo jajab tobanle, jajab tobanle loo badalo jajab, jajab tobanle loo badalo boqolkiiba, boqolkiiba oo loo badalo jajab iyo jajab tobanle, waxaa loo qaybiyaa saddex cinwaan hoosaad. Ciwaan hoosaadka koowaad sida: 3.2.1, wuxuu ka hadlaa u badalida jajabyada loo badalo jajab tobanle iyo Boqolayada.

Waxaa kale oo uu ina siiyaa (hadlaa) sida loogu soo saaro jajab tobanlaha laba god ama saadex god, dhibicda dabadeed. Qayb hoosaadka 3.2.2, u badalka jajab tobanlaha dhammaada jajabyo iyo boqolayo ayaa lagu qaadan doonaa. Qaybta saddexaad ee ciwaan hoosaadkan 3.2.3 u badalka boqolkiiba loo badalayo jajab iyo tobanle ayaan ku qaadan doonaa.

Gudbinta Cashirka

Dood kasta oo ku saabsan ciwaan hoosaadkani waxay ka soo qaadaysaa arday in ay aqoon fiican u leeyihiin qaybta dheer ee jajabyada iyo hadhaaga, sidaas darteed waxaad rajaynaysaa in hawlgalada lagu siiyay ay ka rajaynasaa in hawlgalada lagu siiyay ka qaybgalaan, iyo shaqo kooxeedkaba. Wax badan oo la soo jeediyaa waxay ku saabsan yihiin heshiiska ardayda ee hawlgalka lagugu

siiyay, ciwaan hoosaad kasta. Habka loo gudbinayaa ciwaan hoosaad kasta waa sidan soo socota.

3.2.1 Badalida Jajabyada loo badalayo Jajab tobanle iyo Boqolkiiba

Si aad casharka u bilawdo marka hore waydii ardayda inay xasuustaan qeexida jajab, jajab u qoran heerka ugu hooseeya. Hadda waxaad xasuusan tahay in ardaydu soo barteen isu-qaybinta dheer heerkii hoose, dabadeed ardayda waydii inay si wada jir ah uga shaqeeyeen hawlgalka 3.2 ku wareeg fasalka si aad uga taageertid ugana caawiso waxyaalaha ay kaga doodayaan hawlgalka 3.2. hubi in arday kastaa ka shaeeyay.

Hadda ardayda waydii hawlgalada ay kala kulmeen ama heleen hadhaa eber ah qaybtii dheerayd iyo su'aalaha hadhaagu eber ka duwanaaday?

Waydii ardaydu, haddii qaybintu aanay ku dhammaan hadhaa eber ah, side ayaynu ugu isticmaali karnaa tirooyinkan nolosha caadiga ah? U sheeg ardayda in tirooyinkan in loo kala goynkaro godad tirooyin ah oo la isticmaali karo. Adigoo tan maskaxda ku haya bar ardayda fikrada ku soo ururinta jajab tobanlaha laba god ama saddex god, barta jajab tobanlaha dabadeed. Ardaydu ha akhriyaan xeerarka salka (aasaasiga) ah ee soo ururuinta ee ku qoran buugga ardayga. U sharax arintan adigoo isticmaalaya tisaalayaasha 1, 2 iyo 3 ee lagugu siiyay xeerarka ku soo ururinkaraan jajab tobanlaha laba god ama saddex god barta isku badalka jajab loo badalayo jajab tibanlayaal, isticmaal hawlgalka 3.2 su'aalo waydii ardayda hababka jajabyada loogu badalo jajab tobanlayaal.

Hadda u sharax habka jajabyada loogu badalo jajab tobanlayaal, adigoo isticmaalaya tusaalayaasha lagugu siiyay bogga (7 – 8) (tusaalayaasha 4, 5, 6, 7)

Adigoo raacaya tusaalayaasha, waydii ardayda inay caddeeyaan qaybinaha-dheer mida ku dhammaata hadhaa eber ah? Iyo mida aan ku dhammaan eber?

Ardaydu ha akhriyaan qeexida 3.4 iyo qeexida 3.5 ee lagugu siiyay (ama ku qoran) bogga 9 ee buugga ardayga, waydii ardayda haddii ay xasuusan karayaan macnaha qiime rugeedka ee tirooyinka tirsiimo. Hadda bar macnaha qiimaha godadka ee jajab tobanlaha barta jajab tobanlaha dabadeed. Hubi in ardaydu fahmeen xeerarka ku soo **ururinta**, u kala saar jajab tobanlayaasha

kuwo dhammaada iyo kuwo aan dhammaan, hababka loogu badalo jajabyada jajab tobanlayaal iyo qiima rugeedka, waxaad isticmaali kartaa Hawlgalo iyo tusaalayaal si aad u tusto ama ugu sharaxdid, siina shaqo fasal ahaan layliska 3.1.1 tirooyinka 1,2 iyo 3 ama su'aalo aad adigu iskaa u samaysato.

Si aad u barato fikrada odhanaysa jajabyada u badal boqolkiiba, ardaydu waa inay fahmaan sida loo qoro boqolkiiba iyo macnaheeda.

Sidaas darteed ardaydu waa inay ka doodaan hawlgalka 3.3, ee lagugu siiyay bogga 9aad ee buugga ardayga ku wareeg fasalka inta ay shaqaynayaan si aad ugu burisid ama taageertid, hubina in arday kastaa ka qayb qaadanayo hawlgalka. Ardaydu ha soo jeediyaan waxay helaan (maxsuulka) hana ku qoraan sabuurada adigoo ku salaynaya jawaabahooda, sax kulana tali wixii kale ee ay u baahan yihiin, ku hogaami ardayda inay isticmaalaan macnaha dhabta ah ee "Boqolkiiba) iyo sida loo qoro, waanad u sharxi kartaa adigoo isticmaalaya qeexida 3.6 iyo tusaalayaasha 9aad iyo 10aad ee lagugu siiyay bogga 10aad ee buugga ardayga.

Qiimayn

Qiimaynta ardayda lagu qiimaynayo inay fahmeen ku seebida jajab tobanlayaasha, jajab tobanlayaasha dhammaada, jajab tobanlayaasha aan dhammaan qiime rugeedyada, u badalka jajabyada loo badalo jajab tobanlayaasha, u badalka jajabka loo badalayo boqolkiiba, waa lagama maarmaan. Arintan darteed waxaad siin kartaa su'aalo kadis ah oo ay ka mid yihiin qeexidaha jajab tobanlayaasha dhammaada iyo kuwa aan dhammaanin.

Xeerka ku soo ururinta jajab tobanlayaasha,

u badalka jajabka loo badalayo jajab tobanlayaal,

u badal jajabka loo badalayo Boqolkiiba.

Waxa kale oo aad siin kartaa layliska 3.1 shaqo fasal ahaan, hubina shaqadooda.

Jawaabaha hawlgalka 3.2

Adigoo isticmaalaya qaybinta dheer

b.

$$\begin{array}{r|l} & 0.5 \\ \hline 2 & 10 \\ & \underline{10} \\ & 0 \end{array}$$

waayo $\frac{1}{2} = 0.5$

t.

$$\begin{array}{r|l} & 0.75 \\ \hline 4 & 30 \\ & \underline{28} \\ & 20 \\ & \underline{20} \\ & 0 \end{array}$$

waayo $\frac{3}{4} = 0.75$

j.

$$\begin{array}{r|l} & 0.4 \\ \hline 5 & 20 \\ & \underline{20} \\ & 0 \end{array}$$

waayo $\frac{2}{5} = 0.4$

x. $\frac{8}{13} = 0.61538....$

Kh.

$$
\begin{array}{r|l}
7 & 3.142 \\
\hline
 & 22 \\
 & -21 \\
 & \underline{10} \\
 & 7 \\
 & \underline{30} \\
 & 28 \\
 & \underline{20} \\
 & 14 \\
 & \underline{60} \\
 & 56 \\
 & \underline{40}
\end{array}
$$

Isticmal qeybta dheer $\frac{22}{7} = 3.14285...$

Furfurista hawlgalka 3.3

1. Boqolkiiba macnaheedu waa, boqol loo qeybiyey.

   * Jajab hooseyhoogu yahay 100
   * Summadda boqolkiiba waa %
   * b% waxaa loo akhriyaa b% boqlkiiba

2. b) $\frac{1}{2} = \frac{1\times 50}{2\times 50} = \frac{50}{100} = 50\%$ t) $\frac{1}{4} = \frac{1\times 25}{4\times 25} = \frac{25}{100} = 25\%$

   j) $\frac{3}{4} = \frac{3}{4}\times\frac{25}{25} = \frac{75}{100} = 75\%$ x) $\frac{1}{1} = \frac{1\times 100}{1\times 100} = \frac{100}{100} = 100\%$

Jawaabaha layliska 3.2

1. b)

$$
\frac{3}{5} = 0.6 \longrightarrow 5\overline{)\begin{array}{l}0.6\\30\\\underline{30}\\0\end{array}}
$$

t)

$$\frac{5}{2} = 2.5 \longrightarrow 2\overline{)\,5}^{\,2.5}$$

$$\underline{4}$$

$$10$$

$$\underline{10}$$

$$0$$

j)

$$\frac{5}{6} = 0.833 \longrightarrow 5\overline{)\,50}^{\,0.833...}$$

$$\underline{48}$$

$$20$$

$$\underline{18}$$

$$20$$

x) $\frac{2}{7} = 0.2857143$

kh) $\frac{7}{3} = 2.3333$

= 2.333 (Marka lagu soo ururiyo seddexgod barta jajabtobanalaha)

d) $\frac{1}{6} = 0.16666.$

r) $\frac{11}{5} = 2.2$

s) $\frac{100}{3} = 33.333$ (marka lagu soo ururiyo seddex god bara jajabto banlaha)

2. b) Marka lagu soo uruiyo seddexgod $\frac{1}{3} = 0.333$

t) $\frac{3}{4} = 0.75$ (jajabtobanle dhammaada)

j) $\frac{3}{8} = 0.375$ (jajabtobale dhammaada)

x) $\frac{2}{7} = 0.2857143$ (jajabtobanle aan dhammaanin)

Marka lagu soo ururiyo seddex god $\frac{2}{7} = 0.286$

kh) $\frac{22}{7} = 3.1428571$ (jajabtobanle aan dhammaanin)

Marka lagu soo ururiyo seddexgod $\frac{22}{7} = 3.143$

d) $\frac{7}{3} = 2.333$ (jajabtobanle aan dhamaan)

Marka lagu soo ururiyo seddexgod $\frac{5}{6} = 0.833$

r) $\frac{5}{6} = 0.8333$ (jajabtobanle aan dhammaan)

s) $\frac{11}{3} = 3.6666$

sh) $\frac{9}{10} = 0.9$ (jajabtobanle dhammaada)

dh) $\frac{13}{15} = 0.86666$ (jajabtobanle aan dhammaan)

Marka lagu soo ururiyo seddexgod barta jajabtobanlaha $\frac{13}{15} = 0.867$

3. b) God-rugeedka “3” ee jajabtobanlaha 1.312 waa haltobnaad.

t) God-rugeekda “3” ee jajabtobanlaha 0.013 waa halkumaad.

j) God-rugeedka “3” ee jajabtobanlaha 5.432 waa halboqolaad.

x) God-rugeedka “3” ee jajabtobanlaha 10.341 waa haltobnaad.

4. b) $\frac{23}{100} = 23\%$

t) $\frac{2}{5} = \frac{2 \times 20}{5 \times 20} = \frac{40}{100} = 40\%$

j) $\frac{13}{50}=\frac{13\times 2}{50\times 2}=\frac{26}{100}=26\%$

x) $\frac{12}{7}=1.71$ (marka lagu soo ururiyo barta jajabtobanlaha laba god)

hadda $\frac{1.71\times 100}{100}=\frac{171}{100}=171\%$

kh) $\frac{8}{13}=0.62$ (marka lagu soo ururiyo laba god) sidaas darteed

$\frac{8}{13}=0.62=\frac{0.62\times 100}{100}=62\%$

3.2.2 U badalida jajab tobanlayaasha dhamaada jajabyo iyo boqolkiiba

Waxaad ku bilaabi kartaa hawlgalka 3.4 ee ku qoran buugga ardayga bogga 11, ku wareeg fasalka si aad u caawiso uguna buuriso ardayda shaqadooda, muddo yar ka dib u ogolow ardayda in ay ishortaagaan fasalka oo ay soo jeediyaan waxay kaga jawaabeen (qabteen)hawlgalka. Raadi siday ardaydu ugu ekaysiin lahaayeen jawaabahooda kuwa hawlgalka 3.4 leeyahay, dabadeedna u sharax (tus) sida (boqolkiiba) lagu badalo jajab iyo sida loogu badalo jajab tobanlayaasha dhammaada, adigoo isticmaalaya tusaalayaasha lagugu siiyay bogga 12 (tusaalayaasha 10 iyo 11).

Qiimayn (dabagal)

Waxaad qiimayn kartaa ardayda marka ay ka shaqeeyaan hawlgalka 3.4 iyo shaqo kooxeeda 3.2, waxaa kale oo aad siin kartaa layliska 3.2.2, shaqo guri ahaan, hana soo jeediyaan shaqadooda. Waxaa kale oo aad siin kartaa shaqo fasal, su'aalo aad adigu samaysatay, siina shaqo fasal.

Furfurista Hawlgalka 3.4

1. b) $0.5=\frac{0.5\times 10}{10}=\frac{5}{10}=\frac{1}{2}$

t) $0.25 = \frac{0.25 \times 100}{100} = \frac{25}{100} = \frac{1}{4}$

j) $0.75 = \frac{0.75 \times 100}{100} = \frac{75}{100} = \frac{3}{4}$

x) $0.01 = \frac{0.01 \times 100}{100} = \frac{1}{100}$

kh) $0.005 = \frac{0.005 \times 1000}{1000} = \frac{5}{100} = \frac{1}{200}$

d) $0.281 = \frac{0.281 \times 1000}{1000} = \frac{281}{1000}$

2. si loogu badalo jajabyada boqolkiiba waxaan marka hore ka dhigaynaa hooseeyayaasha 100

b) $0.5 = \frac{5}{100} = \frac{5 \times 10}{10 \times 10} = \frac{50}{100} = 50\%$

t) $0.25 = \frac{25}{100} = 25\%$

j) $0.75 = \frac{75}{100} = 75\%$

x) $0.005 = \frac{0.005 \times 100}{100} = \frac{0.5}{100} = 0.5\%$

Jawaabaha Layliska 3.3

1. b) $0.2 = \frac{0.2 \times 10}{10} = \frac{2}{10} = \frac{1}{5}$

t) $0.02 = \frac{0.02 \times 100}{100} = \frac{2}{10} = \frac{1}{50}$

j) $0.56 = \frac{0.56 \times 100}{100} = \frac{56}{100} = \frac{14}{25}$

x) $0.025 = \frac{0.025 \times 1000}{1000} = \frac{25}{1000} = \frac{1}{40}$

kh) $0.64 = \frac{0.64 \times 100}{100} = \frac{64}{100} = \frac{16}{25}$

d) $0.72 = \frac{0.72 \times 100}{100} = \frac{72}{100} = \frac{18}{25}$

2. b) $0.2 = \frac{2}{10} = \frac{1}{5} = \frac{75}{100} = 20\%$

t) $0.02 = \frac{2}{100} = 2\%$

j) $0.56 = \frac{56}{100} = 56\%$

x) $0.025 = \frac{0.025 \times 100}{100} = \frac{25}{100} = 2.5\%$

Kh) $0.64 = \frac{64}{100} = 64\%$

d) $0.72 = \frac{0.72 \times 100}{100} = \frac{72}{100} = 72\%$

3. b) Run t) Run j) Run
x) Run kh) Been d) Run

3.2.3 U badalida Boqolkiiba loo badalayo jajab iyo jajab tobanlayaal

Waxaad ku bilaabi kartaa hawlgalka 3.5 ee lagugu siiyay bogga 13 ee buugga ardayga, ku wareeg fasalka si aad u caawiso ardayda mooraalkooda aad u dhisto (sii taageero). Markay shaqeeyaan dabadeed, waad hubin kartaa shaqada ardayda, ama jawaabaha ayaad sabuurada ugu qori kartaa dabadeed ayaad hubin jawaabahooda mid kastaa.

Hadda samee kooxo afar ka kooban, dabadeed wad shaqo kooxeedka 3.3 ee lagugu siiyay bogga 14 ee buugga ardayga. Muddo ka dib koox kasta arday ka mid ahi ha soo jeediyo waxay qabteen. Ardaydu ha ka doodaan kuna heshiiyaan jawaabaha ay heleen kooxuhu, hadda adiga ayaa siin kara sixitaan, waxaanad sii kartaa habka loogu badalo boqolkiiba jajab iyo tobanlayaal. Adigoo isticmaalaya tusaalaha 12 ee bogga 15 ee buugga ardayga. Ardaydu ha fiiriyaan jajab, jajab tobanle iyo boqolkiiba qaabkeeda hal tiro oo kaliya ayagoo isticmaalaya.

Dabadeed ardaydu ha akhriyaan faalooyinka ku yaala bogga 15, waydii ardayda inay bixiyaan tusaalayaal ku saabsan jajab qumane, ma qumane iyo tiro dhafan oo aan ahayn kuwa buugga ku yaala. Ardayda waxaad u qaabayn kartaa xeer ay raacaan adigoo isticmaalaya tusaalayaasha 13 ee buugga ardayga bogga 13.

Qiimayn

Waxaad qiimayn kartaa ardayda fahankooda marka ay ka shaqaynayaan hawlgalka iyo shaqo kooxeedka 3.3, waxa kale oo aad u diri kartaa layliska 3.2.3 shaqo guri ahaan, Hana soo jeediyaan shaqadooda ay qabteen.

Furfurista (xalka) Hawlgalka 3.5

1. b) 80% = 80x1/100 = 80/100 = 8/10 =4/5.
   t) 95% = 95/100 = 19/20
   j) 15% = 15/100 = 3/20.
   x) $2.5\% = \frac{2.5}{100} \times \frac{10}{10} = \frac{25}{1000} = \frac{1}{40}$
   kh) 25% = 25/100 = ¼.
   d) 1.5% = 1.5/100 = 15/1000= 3/200.
2. b) 80% = 80/100 = 8/10 = 4/5 = 0.8
   t) 95% = 95/100 = 19/20 = 0.95.
   j) 15% = 15/100 = 0.15
   x) 2.5% = 2.5/100 = 25/1000 = 0.025
   kh) 35% = 35/100 = 0.35
   d) 5% = 5/100 = 0.05
   r) 0.24% = 0.24/100 = 0.0024
3. b) 20/100 x 100 =20 t) $\frac{20}{100} \times 60 = \frac{20 \times 60}{100} = 12$
   j) $\frac{20}{100} \times 30 = \frac{600}{100} = 6$ x) $\frac{20}{100} \times 20 = \frac{400}{100} = 4$

Fur-furista shaqo kooxeedka 3.3

1. wadarta sanduuqyadu waa 99
2. tirada sanduuqyada hadhaysani waa 33,kuwa aan hadhaysnaynina waa 66.
3. Jajab ahaan sanduuqyada hadhaysani waa 33/99
   1/3 jajab tobanla ahaan sanduuqyadu waa 0.33
   Marka laguu soo ururiyo laba god barta jajab tobanlaha kadib

Boqolkiiba ahaana sanduuqyada hadhaysani ugu dhawaan waa 33%=(0.33 33/100)

4. Jajab ahaan sanduuqyada aan hadhaysnayni waa 66/99 = 22/33 = 2/3
Jajab tobanle ahaan sanduuqyada aan hadhaysnayni waa 0.67 marka lagu soo ururiyo laba god barta jajab tobanlaha ka dib .
Boqolkiiba ahaan sanduuqyada aan hadhaysnayni ugu dhawaan waa

$$67\% = \frac{0.067}{100} = \frac{0.67 \times 100}{100} = \frac{67}{100} = 67\%$$

5. Jajab tabonlaha sanduuqyada hadhaysani waa ay soo noqnoqdaan, kuwa aan hadhaysanayna ma soo noqnoqdaan.

Fur-furista Layliska 3.4

1. b) $30\% = \frac{30}{100} = \frac{3}{10}$

t) $1.2\% = \frac{12}{100} = \frac{6}{50} = \frac{3}{25}$

j) $1.2\% = \frac{1.2}{100} = \frac{1.2 \times 10}{100 \times 10} = \frac{12}{1000} = \frac{6}{500} = \frac{3}{250}$

x) $0.07\% = \frac{0.07}{100} = \frac{0.07 \times 100}{100 \times 100} = \frac{7}{10,000}$

kh) $0.05\% = \frac{0.05}{100} = \frac{0.05 \times 100}{100 \times 100} = \frac{5}{10,000} = \frac{1}{2000}$

d) $23\% = \frac{23}{100}$

r) $39\% = \frac{39}{100}$

s) $0.027\% = \frac{0.027}{100} = \frac{0.027}{100} \times \frac{1000}{1000} = \frac{27}{100,000}$

2. b) $65\% = \frac{65}{100} = 0.65$

t) $135\% = \frac{135}{100} = 1.35$

j) $220\% = \frac{220}{100} = 2.2$

x) $15\% = \frac{15}{100} = 0.15$

Kh) $60\% = \frac{60}{100} = 0.6$

d) $20\% = \frac{20}{100} = 0.2$

r) $66\% = \frac{66}{100} = 0.66$

s) $0.6\% = \frac{0.6}{100} = 0.006$

3. b) $\frac{13}{50}$ waa jajab qumane

t) $\frac{5}{2}$ waa jajab ma- qumane

j) $\frac{12}{7}$ waa jajab ma-qumane

x) $\frac{8}{10}$ waa jajab qumane.

kh) $3\frac{1}{6}$ waa jajab dhafan

d) $5\frac{1}{4}$ waa jajab dhafan.

4.

jajab	Jajab tobanle	Boqolkiiba
21/100	0.21	21%
13/25	0.52	52%
6/25	0.24	24%

3.3 ISBARBAR DHIGA IYO SIDAY U KALA WAAWAYN YIHIIN OO LOO QORO JAJABYADA

Waxaa loo qoondeeyay: 5 xiisadood

Waxaa ugu yare e ardayga

Cutub hoosaadkani marka uu dhamaado ardaydu waxay awoodi doonaan inay:

- *isbar-bar dhigaan jajabyada*
- *u qoraan jajabyada sida ay u kala waawayn yihiin ayagoo ka bilaabaya kan ugu yar ilaa ka ugu wayn.*
- *u qoraan jajabyada sida ay u kala yar-yaryihiin ayagoo ka bilaabaya ka ugu wayn ilaa ka ugu yar*

Erayo cusub

- Isbar-bar dhiga jajabyada, siday u kala waawaynyihiin u qorida jajabyada, laga bilaabo ka ugu yar ilaa ka ugu wayn, laga bilaabo ka ugu wayn ilaa ka ugu yar.

Hor-dhac

Cutubkani waxaan ka helaynaa barasho saa'id ah oo aan barano laba ama in ka badan oo jajabyo ah oo aan isbarbar dhigno, cadaynana midka wayn ama mid ka yar iyo u habaynta jajabyadaa sida u kala waawayn yihiin laga bilaabo ka ugu yar ilaa ka ugu wayn ama laga bilaabo ka ugu wayn ilaa ka ugu yar.

Gudbinta Cashirka

Dooda ciwaan hoosaadkan waxaan u qaadanaynaa in ardaydu ay aqoon u leeyihiin in ay is bar-bar dhigi karaan una qori karaan siday u kala waawayn yihiin tirooyinka tirsiimo, waxa kale oo aan ka soo qaadaynaa in ay yaqaanaan macnaha summadaha < , > iyo =.

Miyaad rajaynaysay in ardaydu si firfircoon uga qayb galeen hawlgalada lagu siiyay shaqo kooxeedka. Jeedinta ciwaan hoosaadkani wuxuu sal u yahay la balamida ardayda ee ku saabsan hawlgalada iyo shaqo kooxeedka.

Isbar-bar dhiga jajabyada

Si aad casharka u bilawdo marka hore waydii ardayda inay isbar-bar dhigaan tirooyinka idil (waxaad siin kartaa lammaane tirooyin tirsiimo ah) sii halka ay marayaan si ay uga shaqeeyaan(si ay isu bar-bar dhigaan tirooyinka tirsiimo, ardayda ugu celi macnaha jajabyada isu dhigma, waydiina inay isbar-bar dhigaan kuna dhiiri gali iyaga inay isticmaalaan summad xisaabeeda ku haboon(=).

Hadda ardayda waxaad kaga caraysiin kartaa hawlgalka 3.7 ee lagugu siiyay bogga 16. Ku wareeg fasalka adigoo ardayda ku dhiirigalinaya, caawinayana iyaga marka ay ka shaqaynayaan shaqo kooxeedka.

Muddo ka dib, ardayda qaarka mid ahi ha soo jeediyaan waxay qabteen sabuurada dusheeda, arday kale su'aalo isku mid ah ha soo jeediyo, jawaabuhu ma isku midbaa? Haddii aanay isku mid ahayn ardaydu ha ku heshiiso mid ka mid ah jawaabaha, samee sidaas oo kale su'aalaha dhammaan.

Hadda sii sixitaankaaga, kana jawaab su'aalaha dhammaan. Markaad u saxdo fiiri ardayda in ay fahmeen hababka laysku barbar dhigo jajabyada marka hooseeyuhu isku mid yahay iyo marka hooseeyuhu kala duwan yahay, isticmaal tusaalayaasha 1 iyo 2 ee lagugu siiyay bogga 18 ee buugga ardayga, si aad u sharaxdo fikradan.

Isbarbar dhigaan u sii gudbin sidii aad isugu barbar dhigi lahayd jajab tobanlayaasha ku sharax tusaalaha 3 iyo 4 ee lagugu siiyay bogga 18 ee buugga ardayga si aad u qiimayso fahanka ardayga. Sii shaqo fasal ardayda adigoo siinaya su'aalo aad samaysay.

U qorida siday u kala hooreeyaan jajabyadu

U gudub hawlgalka 3.8. ardaydu ha ka shaqeeyaan hawlgalka koox ahaan, koox kastaana ha ahaato saddex arday, koox kastaana ha samaysato arday matala oo soo jeediya waxay qabteen. (u ogolow ardayda kooxi inay su'aasha keenaa, kooxaha kalena ha jawaab celiso).

Sii sixitaan, una sharax fikiradan adigoo isticmaalaya tusaalayaasha 5 iyo 6 ee bogga 19 ee buugga ardayga.

Qiimayn

Waxaad qiimayn kartaa ardayda marka ka qayb galaan hawlgalada, marka ay soo jeedinayaan waxay ka shaqeeyeen, waxa kale oo aad siin kartaa layliska 3.3 shaqo guri ahaan, hubina.

Jawaabaha hawlgalka 3.6

1. b) 4/10 wuu ka yaryahay 6/10 sidoo kale 6/10 wuu ka wayn yahay 4/10, 4/10 waxay ina tustaa 4 meelood 10kii qaybood, sidoo kale 6/10 waxay ina tusinaysaa 6 meelood 10 kii qaybood.
   Haddaba 4/10 < 6/10.

   t) 1/12 way ka yar tahay 1/10, sidoo kale 1/10 way ka wayn tahay 1/12.

   1/12 waxay ina tusaysaa 1 meel 12kii qaybood iyo 1/10 waxay ina tusaysaa 1 meel 10kii qaybood

   Hadda 1/12 < 1/10.

   J) 1/5 way ka yar tahay ½ taasi waxa weeyi ½ way ka wayn tahay 1/5

   1/5 waxay ina tusaysaa 1 meel 5tii meeloodba

   ½ waxay ina tusaysaa 1 meel 2dii meeloodba (qaybood)

   Sidaas darteed, 1/5 < ½

   x) 4/10 way ka yar tahay 8/10

   4/10 waxay ina tustaa 4 meelood 10kii qaybood

   8/10 waxay ina tusaysaa 8meelood 10kii qatbood

   Sidaasi darteed 4/10 < 8/10.

2. b) B = ½ (1 meel labadii qayboodba).

   T = ½

   t) J = 1/3 (meel saddexdii qayboodba)

   X = 1/3

   Kh = 1/3

j) qaybta t ayaa yar, waayo b waxaa loo wada qaybiyay laba meelood, t-na waxaa loo wada qaybiyay saddex meelood

x) d = ¼

r = ¼

s = ¼

sh = ¼.

Kh) kuwa X ku hoos qoran tahay ayaa yar, waayo qaybtu waxay ku sii socotaa inay sii yaraato.

Jwaabaha hawlgalka 3.7

1. b) $\frac{1}{12} < \frac{1}{10} < \frac{1}{8}$

t) $\frac{1}{5} < \frac{1}{4} < \frac{1}{3} < \frac{1}{2}$

j) $\frac{5}{12} < \frac{2}{3} < \frac{3}{4} < \frac{7}{8}$

2. b) $\frac{1}{8} > \frac{1}{10} > \frac{1}{12}$ t) $\frac{1}{2} > \frac{1}{3} > \frac{1}{4} > \frac{1}{5}$ j) $\frac{7}{8} > \frac{3}{4} > \frac{2}{3} > \frac{5}{12}$

3. b) $0.3 < 0.35 < 0.52$ t) $0.38 < 0.43 < 0.72 < 0.8$

j) $0.35 < 0.36 < 1.3 < 2.53$

Jwaabaha Layliska 3.5 u habee siday u kordhayaan

1. b) $\frac{1}{3} < \frac{1}{2} < \frac{3}{4} < \frac{4}{5} < \frac{5}{6}$ t) $\frac{5}{12} < \frac{2}{3} < \frac{3}{4} < \frac{7}{8}$

J) $\frac{1}{6} < \frac{1}{5} < \frac{1}{4} < \frac{1}{2} < \frac{2}{3}$ x) $\frac{1}{4} < \frac{3}{10} < \frac{3}{8} < \frac{1}{2} < \frac{2}{3}$

2. U habee siday u yaraanayaan

b) $\frac{5}{6} > \frac{4}{5} > \frac{3}{4} > \frac{1}{2}$

t) $\frac{1}{2} > \frac{1}{3} > \frac{1}{4} > \frac{1}{5} > \frac{1}{6}$

j) $\frac{7}{8} > \frac{3}{4} > \frac{2}{3} > \frac{5}{12}$

3. b) $0.45 < 0.48 < 0.6 < 0.62 < 0.86 < 0.91$

t) $0.48 < 0.57 < 0.63 < 0.72$

4. $0.9 > 0.73 > 0.65 > 0.58 > 0.28$

5. $0.2 = \frac{0.2 \times 100}{100} = \frac{20}{100} = 20\%$

$0.67 = \frac{0.67 \times 100}{100} = \frac{67}{100} = 67\%$

$0.25 = \frac{0.25 \times 100}{100} = \frac{25}{100} = 25\%$

$0.35 = \frac{0.35 \times 100}{100} = \frac{35}{100} = 20\%$

$\frac{4}{5} = \frac{4 \times 20}{5 \times 20} = \frac{80}{100} = 80\%$

$\frac{2}{5} = \frac{2 \times 20}{5 \times 20} = \frac{40}{100} = 40\%$

Sidaasi darteed, marka loo habeeyo boqolkiiba siday u kala waawaynyihiin ayadoo laga bilaabayo ka ugu yar ilaa ka ugu wayn.

$20\% < 25\% < 35\% < 40\% < 67\% < 80\%$.

3.4 ISUGAYNTA IYO KALAGOYN SAA'ID AH OO KU SAABSAN JAJABYADA IYO JAJAB TOBANLAYAASHA

Waxaa loo qoondeeyay: 10 xiisadood

Waxa ugu yare e ardayda

Marka uu dhammaado ka dib ardaydu waxay awoodi doonaan in ay:

- *Xisaabiyaan wadarta jajabka iyo jajab tobanlayaasha*
- *Xisaabiyaan faraqa jajabyada iyo jajab tobanlayaasha.*
- *Xaliyaan (fur-furaan) masalooyinka ku saabsan iskugaynta iyo kala goynta.*

Hordhac

Ciwaan hoosaadkani wuxuu u sii qaybsamaa laba ciwaan hoosaad ka koowaad wuxuu ka hadlaa (ina siiyaa) waxyaalo ku saabsan isuqaybinta jajabyada iyo jajab tobanlayaasha. Qaybta labaad waxay ina siisaa (ka hadashaa) kala goynta jajabyada iyo jajab tobanlayaasha.

Waxaan ka soo qaadaynaa in ardaydu ay aqoon u leeyihiin isugaynta, kala goynta, isudhufashada iyo jajab tobanlayaasha ayna ku soo barteen heerarkoodii hoose ee xisaabta. Si aan horay ugu socono barista ciwaankan waxaan u baahan nahay in aan xasuusino waayo aragnimooyinkii hore ee isugaynta iyo kala goynta.

3.4.1 Isugaynta jajabyada iyo jajab tobanlayaasha

Ku bilaw ciwaan hoosaadkan adigoo siinaya hawlgalka (su'aalo) ku saabsan jajabyada leh hooseeye isku mid ah.

Hawlgal (shaqo fasal)

1. $\square_{\frac{2}{4}} + \square_{\frac{1}{4}} = \square$

2. $\square_{\frac{2}{3}} + \square_{\frac{1}{3}} = \square$

3. $\frac{5}{7}+\frac{2}{7}=$ _____

4. $\frac{5}{8}+\frac{1}{8}=$ _____

Hubi Ardayda Shaqadooda

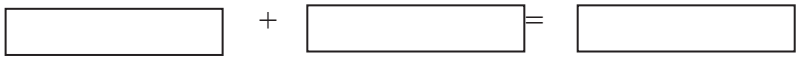
Sii faalo, sixitaan aad u saxaysid sida ay ukala goyn karaan (lahaayen) jajabyada hooseeyeheedu isku midka yahay, waa la sharixi karaa adigoo isticmaalaya su'aalaha 1aad ee ku yaala boga 20 ee buuga ardayga. Dabadeed dhis kooxo ka kooban saddex-saddex qof, dabadeed ardaydu haka qayb galaan 3, 5, wareeg fasalka si aad u dhiiri galiso una caawiso ardayda kooxkooxda u shaqaysa, ardayda kooxaha qaar ka mid ahi hasoo jeediyo maxsuulkooda shaqo kooxeeda ay ku helaan, hana u soo jeediyaan fasalka. U sharax maxsuulka ay ku helaan doodoodii adigoo isticmaalaya tusaale (su'aasha 1aad) waydii kooxaha in ay jidka ay doortaan uu ku shaqayn kaaraayo jajabyada leh hooseeyayaasha isku midka ah, ku dhiiri gali adigoo siinaaya tusaale. Sii gababgabadaada ugu dambaysa tusna habka la iskugu geeyo jajabyada hooseeyohoodu kala duwan yahay, adigoo isticmaalaya Tusaalaha 2aad ee lagu siiyay bogga 21 ee buugga ardayga.

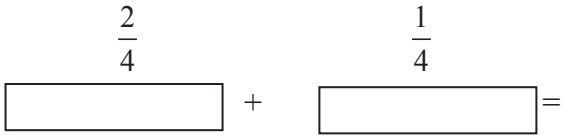
Waxaad tusin kartaa hababka adigoo isticmaalaya tusaalaha 4aad ee lagu siiyay bogga 21ee buugga ardayga. Ardaydu waa in ay si fiican u darsaan (aqoonsan) yihiin marka la isku gaynayo tirooyinka dhafan, waxaa khasab ah in ay u badalaan jajab ma qumanayaal. Si aad u dhigto isku gaynta jajab tobanlayaasha, waxaad waydiisaa ardayda (siisaan su'aalo shaqo fasal ah, si ay u xasuustaan wixii ay ku soo barteen heerkii hoose, tus (u sharax) habka isku gaynta jajab tobanlayaasha adigoo isticmaalaya tusaalaha 3aad lagu siiyay bogga 21 ee buugga ardayga.

Qiimayn

Waxaad qiimayn kartaa ardayda in ay fahmeen marka ay ardaydu ka qaybqaadanayaan hawlgalka iyo shaqo kooxeedka, sii shaqo fasal adigoo su'aalo aad adigu samaysay siinaya.

Waxaa kale oo aad siin kartaa layliska 3.4.1, ee ku yaala bogga 22 ee buuga ardayga, shaqo guri ahaan hana soo jeediyaan(ha ku qoran sabuurada).

1. 

2. 

3. $\frac{5}{7}+\frac{2}{7}=\frac{5+2}{7}=\frac{7}{7}=1$

4. $\frac{5}{8}+\frac{1}{8}=\frac{1}{8}=\frac{3}{4}$

Jawaabaha shaqo kooxeedka 3.4

1. Haddii b/t iyo j/x ay yihiin jajabyo oo t, x ≠0, dabadeed t ≠ x, $\frac{b}{t}+\frac{j}{x}=\frac{b\times x+t\times j}{tx}$

   Tusaale: $\frac{11}{5}+\frac{6}{7}=\frac{11\times 7+5\times 6}{5\times 7}=\frac{77+30}{35}=\frac{107}{35}$

2. b) $\frac{1}{2}+\frac{1}{3}=\frac{1\times 3+2\times 1}{6}=\frac{5}{6}$

   t) $\frac{1}{4}+\frac{1}{5}=\frac{5+4}{4\times 5}=\frac{9}{20}$

   j) $\frac{1}{2}+\frac{1}{3}=\frac{1\times 3+2\times 2}{2\times 3}=\frac{3+4}{6}=\frac{7}{6}$

Jawaabaha layliska 3.6

1. b) $\frac{3}{4}+\frac{5}{4}=\frac{3+5}{4}=\frac{8}{4}=2$

   t) $\frac{1}{6}+\frac{7}{6}=\frac{1+7}{6}=\frac{8}{6}=\frac{4}{3}$

   j) $\frac{1}{2}+\frac{1}{4}=\frac{1\times 4+1\times 2}{2\times 4}=\frac{4+2}{8}=\frac{6}{8}=\frac{3}{4}$

x) $\frac{2}{5}+\frac{1}{3}=\frac{2\times3+5\times1}{5\times3}=\frac{6+5}{15}=\frac{11}{15}$

Kh) $\frac{3}{5}+\frac{1}{2}+\frac{1}{3}$ ama $\frac{3}{5}+\frac{1}{2}+\frac{1}{3}=\left(\frac{3}{5}+\frac{1}{2}\right)+\frac{1}{3}$

$=\frac{3\times2+5\times1}{5\times2}+\frac{1}{3}=\frac{6+5}{10}+\frac{1}{3}=\frac{11}{10}+\frac{1}{3}=\frac{11\times3+10\times1}{30}=\frac{33+10}{30}=\frac{43}{30}$

Dhufsanayaraha ay wadaageen

2, 3, 5 waa 30

Hadaba $\frac{3}{5}+\frac{1}{2}+\frac{1}{3}=\frac{3\times6+1\times15+1\times10}{30}=\frac{43}{30}$

d) $\frac{5}{8}+\frac{1}{2}+\frac{2}{3}$ dh. Y .w 8, 2, 3 waa 24

Sidaas darteed, $\frac{5}{8}+\frac{1}{2}=\frac{2}{3}=\frac{5\times3+1\times2+2\times8}{24}=\frac{15+12+16}{24}=\frac{43}{24}$

$\frac{5}{8}+\frac{1}{2}+\frac{2}{3}=\left(\frac{5}{8}+\frac{1}{2}\right)+\frac{2}{3}=\frac{5\times2+8\times1}{8\times2}+\frac{2}{3}$

$=\frac{10+8}{16}+\frac{2}{3}=\frac{18}{16}=\frac{2}{3}=\frac{18\times3+2\times16}{16\times3}=\frac{54+32}{48}=\frac{86}{48}=\frac{43}{24}$

r) $\frac{1}{10}+\frac{1}{2}=\frac{1\times2+10\times1}{10\times2}=\frac{2+10}{20}=\frac{12}{20}=\frac{3}{5}$

2. b) 0.53 +0.45 = 0.98 t) 0.47 + 0.35= 0.82

j) 0.92 + 0.75 = 1.67 x) 0.271 + 0.451 = 0.722

kh) 1.358+0.814 = 2.172 d) 0.385 + 0.6712 = 1.0562

r) 0.306 + 0.283 =0.589 s) 0.925 + 0.034 = 0.959

3.4.2 Kala –goybnta jajabyada iyo jajab tobanlayaasha

Waxaad ku bilaabi kartaa Hawlgalka 3.8 ee ku yaala bogga 73aad ee buugga ardayga,kuwareeg fasalka si aad ugu dhiiri galiso uguna dabagasho (qiimayso)waxay qabanayaan. Marka ay xasuusanwaayaan ardaydu wixii ay ku soo barteen heererkii hoose ku saabsanaa kala- goynta jajabyada iyo tobanleyaasha. Fadlan caawi iyaga, u,ogalaw ardayda in ay kaga shaqeeyaan saburada.

Hadda usax, ugana jawaab hawgalka 3.8 gali ardayda maskaxdooda kala goynta jajabyada iyo jajab tobanlayaasha, waxaad ku tusi kartaa ama aad ugu sharxi

kartaa figradaha adiga oo isticmaalaya tusaalayasha 5,6,iyo 7 ee kuyaala bogga 73,iyo bogga 74,ee buugga ardayga,

Ardayda waxaa laga rajaynayaa inay kala-goynta jajabyada marka hooseyeyaashu isku midyihiin iyo marka hooseyeyaashu kala,duwanyihiin. Waxaa kale oo lagama maarmaan ah in ay fiiriyaan habka lagaga shaqeeyo marka ay hooseyayaashu kala duwan yihiin oo sidoo kale shaqayanayso marka hooseyayaashu isku midyihiin laakiin ayna jirin jidkale

Qiimayn

Maadaama kala-goynta jajabyada iyo jajab-tobanlayaasha lalaxidhiidhin karo nolol maalmeedka maalinkasta,ardaydu waa inay fahmaan,waxaad qiimayn kartaa ardaydu inay fahmeen marka ay kashaqeeyaan hawlgallada ay kaga shaqeeyaan su,aalaha saburada.adigoo siinaya shaqo fasal (su,aalo adigu samaysay)iyo layliska 3.7 adoo usiinaya shaqo guri ahaaneed una ogolaw inay kasoo jeediyaan fasalka dhexdiisa.

Jawaabaha hawlgalka 3.8

1. b) $\frac{4}{5}-\frac{1}{5}=\frac{4-1}{5}=\frac{3}{5}$

   t) $\frac{3}{2}-\frac{1}{2}=\frac{3-1}{2}=\frac{2}{2}=1$

   j) $\frac{7}{8}-\frac{3}{5}=\frac{7\times5-8\times3}{8\times5}=\frac{35-24}{40}=\frac{11}{40}$

2. Jajabka saliida aan la isticmaalin waa saliida la soo iibiyey oo laga jaray saliida la isticmaalay. Saliida la soo iibiyey waa 3/4 jajabka saliida la isticmaalay waa 1/4 dabadeed jajabka saliida aan la isticmaalin waa $\frac{3}{4}-\frac{1}{4}=\frac{3-1}{4}=\frac{2}{4}=\frac{1}{2}$

3. b) 0.75 t) 0.597 j) 0.749

   -0.25 -0.368 -0.387

   0.50 0.229 0.362

Jawaabaha Layliska 3.7

1. b) $\frac{3}{4}-\frac{1}{8}=\frac{3\times8-4\times1}{32}=\frac{24-4}{32}=\frac{20}{32}=\frac{5}{8}$

t) $\frac{6}{7}-\frac{1}{2}=\frac{6\times2-7\times1}{7\times2}=\frac{12-7}{14}=\frac{5}{14}$

j) $\frac{7}{9}-\frac{1}{3}=\frac{7\times3-9\times1}{9\times5}=\frac{21-9}{27}=\frac{12}{27}=\frac{4}{9}$

x) $\frac{7}{8}-\frac{1}{12}=\frac{7\times12-8\times1}{8\times12}=\frac{84-8}{96}=\frac{76}{96}=\frac{19}{24}$

Kh) $\frac{5}{8}-\frac{1}{3}=\frac{5\times3-8\times1}{8\times3}=\frac{15-8}{24}=\frac{7}{24}$

d) $\frac{4}{5}-\frac{5}{12}=\frac{4\times12-5\times5}{5\times12}=\frac{84-25}{60}=\frac{23}{60}$

r) $\frac{5}{12}-\frac{1}{8}=\frac{5\times8-12\times1}{12\times8}=\frac{40-12}{96}=\frac{28}{96}=\frac{7}{24}$

s) $\frac{28}{10}-\frac{14}{8}=\frac{28\times8-14\times10}{10\times8}=\frac{224-140}{80}=\frac{84}{80}=\frac{21}{20}$

sh) $\frac{16}{12}-\frac{16}{12}=\frac{16-16}{12}=\frac{0}{12}=0$

dh) $\frac{19}{5}-\frac{14}{5}=\frac{19-14}{5}=\frac{5}{5}=1$

2. b)
$$\begin{array}{r} 0.469 \\ -\ 0.142 \\ \hline 0.327 \end{array}$$

t)
$$\begin{array}{r} 0.847 \\ -\ 0.307 \\ \hline 0.540 \end{array}$$

j)
$$\begin{array}{r} 0.682 \\ -\ 0.471 \\ \hline 0.211 \end{array}$$

x)
$$\begin{array}{r} 0.889 \\ -\ 0.268 \\ \hline 0.621 \end{array}$$

kh)
$$\begin{array}{r} 0.759 \\ -\ 0.432 \\ \hline 0.327 \end{array}$$

d)
$$\begin{array}{r} 0.213 \\ -\ 0.200 \\ \hline 0.013 \end{array}$$

3. b) $20\frac{2}{5}-17\frac{1}{2}=$ marka hore aan u badalno jajabyada dhafan jajab ma qumanayaal

$20\frac{2}{5}=\frac{20\times5+2}{5}=\frac{102}{5}$

$17\frac{1}{2}=17+\frac{1}{2}=\frac{17\times2+1}{2}=\frac{35}{2}$

Sidaasi darteed, $20\frac{2}{5}-17\frac{1}{2}=\frac{102}{2}-\frac{35}{2}$

$\frac{2\times102-5\times35}{5\times2}=\frac{204-175}{10}=\frac{29}{10}$

$6\frac{1}{3}=3\frac{1}{2}$ marka hore aan u badalno jajabyada dhafan jajab ma qumanayaal $6\frac{1}{3}-2\frac{1}{3}$.

t) $6\frac{1}{3}=\frac{3\times6+1}{3}=\frac{19}{3}$ iyo $2\frac{1}{3}=\frac{3\times2+1}{3}=\frac{7}{3}$

Sidaasi darteed, $6\frac{1}{3}-2\frac{1}{3}=\frac{19}{3}-\frac{7}{3}=\frac{19-7}{3}=\frac{12}{3}=4$

j) $5\frac{2}{5}-2\frac{2}{4}$ mar labaad aan u badalo jajabyada dhafan jajab ma-qumanayaal.

$1\frac{1}{4}=\frac{4\times2+1}{4}=\frac{9}{4}$

$5\frac{2}{5}=\frac{5\times5+2}{3}=\frac{27}{5}$

Dabadeed, $5\frac{2}{5}-\frac{21}{4}=\frac{27}{5}-\frac{9}{4}=\frac{4\times27-5\times9}{5\times4}=\frac{108-45}{20}=\frac{63}{20}$

4. Dhul beereedka beeralaydu dhamaan waa 1. Beerooluhu wuxuu qoday Isniintii 1/5 dhulkoodii. Salaasana wuxuu qoday ¼ dhulkoodii, sidaasi darteed beerooluhu wuxuu qoday labada cisho 1/5 + ¼.

:. Jajab ahaan dhulka la qoday waa $\frac{1}{5}+\frac{1}{4}=\frac{4+5}{5\times4}=\frac{9}{20}$

b) jajab ahaan dhulka inta aan la beerin waa $\frac{1}{20}-\frac{9}{20}=\frac{20-9}{20}=\frac{11}{20}$

t) dhulka la qoday (beeray) waa 9/20, iyada oon u badaleeyn boqoleeyna waa sidan: $\frac{9\times5}{20\times5}=\frac{45}{200}=45\%$

:. Boqolkiiba inta dhul ah ee la qoday waa 45%.

j) jajab ahaan dhulka inta aan la qodini waa 11/20. Waxaan u badalaynaa tan boqolkiiba. Sidaas darteed $\frac{11}{20} = \frac{11 \times 5}{20 \times 5} = \frac{55}{100} = 55\%$

Ama maadaama wadarta dhulku tahay 100%, oo boqolkiiba inta la beerayna tahay 45%, dabadeed boqolkiiba dhulka inta aan la qodin waa 100% - 45% = 55%.

3.5 SII GUDO GALIDA(SAA'ID) ISKU-DHUFASHADA IYO ISUQAYBINTA JAJABYADA IYO JAJAB TOBANLAYAASHA

Waxkhtiga loo qoondeeyay: 11 xiisadood

Waxa Ardayga laga rabo

Dhammaadka cutub-hoosaadkan ardaydu waxay awoodi doonaan in ay:

- *raadiyaan (helaan) taranta jajabyada*
- *raadiyaan (helaan) taranta jajab tobanlayaasha*
- *raadiyaan taranta jajabyada iyo jajab tobanlayaasha*
- *u qaybiyaan jajab jajab kale*
- *isu qaybiyaan laba jajab tobanle*
- *u qoraan tirooyinka tirsiimo qormo saynis*

Hordhac

Cutub hoosaadkan waxaan ku baran doonaa waxbarasho saa'id ah oo ku saabsan isku=dhufashada iyo isu-qaybinta.

Jajabyada iyo jajab tobanlayaasha, waxaana loo sii qaybiyaa laba cinwaan hoosaad. Ciwaan hoosaadka koowaad 3.5.1 wuxuu ka hadlayaa isku-dhufashada jajabyada iyo jajab tobanlayaasha, ciwaan hoosaadka labaad 3.52 wuxuu ina siinayaa isu-qaybinta jajabyada iyo jajab tobanlayaasha.

Kaabayaasha waxbarasho

Dooda ku saabsan ciwaan hoosaadka koowaad ardayda waxaan u qaadaneynaa inay wax aqoon ah u leeyihiin sharciyada isku-dhufashada tirooyinka tirsiimo, isku-dhufashada jajabyada iyo isku-dhufashada jajab tobanlayaasha.

Dooda ciwaan hoosaadka labaadna waxay ardayda ka soo qaadaysaa in ay aqoon hore u leeyihiin sharciyada isu-qaybinta tirooyinka tirsiimo, isu-qaybinta jajabyada, isuqaybinta jajab tobanlayaasha. Ardayda waxaa laga filayaa inay si firfircoon uga qayb-galaan dooda, hawlgalka, ayna ka shaqeeyaan dhammaan laylisyada, hababka ciwaan hoosaadan loo fulinayo waxaa loo soo wariyay(labiyay) sidan soo socota.

3.5.1 Isku-dhufashada Jajabyada iyo jajab tobanlayaasha

Si aad casharka u bilawdo, xasuusi ardayda inay soo barteen isku dhufashada tirooyinka tirsiimo heerarkii hoose ee xisaabta, sii tiro tirsiimo oo ka kooban laba, saddex god waydiina inay soo saaraan tarantooda, dhiiri gali caawina.

Ardaydu ha ka sahqeeyaan hawlgalka 3.10 sii waxoogaa waqti ah oo ay kaga shaqeeyaan, ku wareeg fasalka si aad u dhiiri galiso una caawiso. Muddo ka dib u ogolow ardayda in ay ku qoraan su'aalaha sabuurada, u sax dabadeedna sii jawaabaha hawlgalka 3.10 tan markaad samayso waxaad ardayda u habayn kartaa xeerarka isku-dhufashada jajabyada iyo jajab tobanlayaasha.

Ardayda fahamsii macna xisaabeedka ay leedahay erayada "ee" tus ama u sharax isku-dhufashada jajabyada iyo jajab tobanlayaasha adigoo isticmaalaya tusaalayaasha 1, 2 iyo 3 ee ku qoran (lagugu siiyay) bogga 26 iyo 27 buugga ardayga. Ardaydu waa inay fahmaan talaabooyinka la marayo marka laysku dhufanayo laba jajabtobanle (bogga 27).

Qiimayn

Waxaad ku qiimayn kartaa in ardaydu fahmaan isku-dhufashada hawlgallada aad u sii shaqo fasal, waxaa kale oo aad siin kartaa layliska 3.5, shaqo guri ahaan, hana soo jeediyaan.

Jawaabaha hawlgalka 3.9

1. b) jaantuska waxaa loo qaybiyay 4 qaybood oo isleeg
   t) haa ½ j) haa ¼
   x) maadaama oo ay tahay badh-badhkii, waxaa loo qori karaa ½ x ½.

2. "ee" macnaheedu waa isku-dhufasho

b)	½ x 2 = 2/2 =1	kh)	½ x ¾ =3/8
t)	½ x (½)= ¼	d)	½ x 5/6 = 5/12
j)	½ x 1/3 = 1/6	r)	½ x 2/3 = 2/6 = 1/3
x)	½ x ¼ = 1/8	s)	½ x 6/5 = 6/10 = 3/5.

3. b) ¼ x 2/15 = 2/60 = 1/30 t) ¼ x 1/6 = 1/24
   j) ¼ x 2/5 = 2/20 = 1/10 x) ¼ x5/8 = 5/32
   kh) ¼ x 10/9 = 10/36 = 5/18
4. 2/3 ee 60 waa 2/3 x60 = 120/3 =40
5. 2/3 ee 45 waa 2/3 x45 = 90/3 =30
6. b) marka 1aad 342 ku dhufo 2. 342x2 = 684.
   Waxaa jira sadex god barta jajab tobanlaha kadib, haddaba 0.342 x 2 =0.684

   t) marka hore isku-dhufo 213 iyo 2 213x2 = 426

   waxaa jira shan god barta jajab tobanlaha ka dib dabadeed taran dhexdeed waa inay jiraan shan god oo ka dambeeya barta jajab tobanlaha.

   213x2 = 0.00426

   j) marka hore 412 ku dhufo 21

   412 x 21 = 8652

   Waxaa jira shan god oo ka dambeeya barta jajab tobanlaha, sidaas awgeed taranta dhexdeeda waa inay jiraan sha god oo dambeeya barta jajab tobanlaha, sidaas darteed;

   0.412 x 0.08652
7. Cayaaryahan wuxuu cabaa ¾ litir oo caano ah shan cisho toddobbaadkii,

   Sidaas awgeed, cayaaryahanku wuxuu cabayaa $\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}=\frac{15}{4}$ litir oo caano ah todobaad kasta.

Jawaabaha Layliska 3.8

1. b) $\frac{1}{2}\times\frac{2}{3}=\frac{1\times2}{2\times3}=\frac{2}{6}=\frac{1}{3}$

   t) $\frac{1}{6}\times\frac{12}{13}=\frac{1\times12}{6\times13}=\frac{12}{78}=\frac{2}{13}$

   j) $\frac{27}{11}\times\frac{11}{27}=\frac{297}{297}=1$

x) $\frac{35}{11}\times\frac{11}{35}=\frac{35\times11}{11\times35}=\frac{385}{385}=1$

kh) $\frac{20}{9}\times\frac{7}{10}=\frac{20\times7}{9\times10}=\frac{140}{90}=\frac{14}{9}$

d) $\frac{3}{5}\times\frac{15}{18}=\frac{3\times15}{5\times18}=\frac{45}{90}=\frac{1}{2}$

r) $\frac{10}{143}\times\frac{143}{27}=\frac{10\times143}{143\times27}=\frac{10}{27}$

s) $\frac{8}{17}\times\frac{51}{64}=\frac{8\times51}{17\times64}=\frac{3}{8}$

sh) $2\frac{2}{3}\times\frac{6}{7}$, marka koowaad aan u badalno jajab, tirada dhafan

Hadaba, $2\frac{2}{3}=2+\frac{2}{3}=\frac{2\times3+2}{3}=\frac{8}{3}$

Sidaas darteed, $2\frac{2}{3}\times\frac{6}{7}=\frac{8}{3}\times\frac{6}{7}=\frac{48}{21}=\frac{16}{7}$

dh) $2\frac{2}{5}\times2\frac{1}{2}=$ marka hore tirooyinka dhafan u badel jajab, Hadaba

$2\frac{2}{5}=2+\frac{2}{5}=\frac{2\times5+2}{5}=\frac{12}{5}$

$2\frac{1}{2}=2+\frac{1}{2}=\frac{2\times2+1}{2}=\frac{5}{2}$

Sidaas darteed, $2\frac{2}{5}\times2\frac{1}{2}=\frac{12}{5}\times\frac{5}{2}=\frac{60}{10}=6$

2. b) 0.75×0.32

Talaabada koowaad: marka koowaad isku dhufo 75 iyo 32,
$75 \times 32 = 240$

Talaaada 2^{aad} tiri tirada god ee ka dambeysa barta jajabtobanlaha labada tiraba. Waana 4 god, oo ka dambeeya barta jajabtoanlaha, dabadeed taranta waa inay 4 god ka dambeeyaan barta jajabtobanlaha.

Talaabad 3^{aad}: $0.75 \times 0.32 = 0.2400$

t) 0.59×0.13

Talaabada 1[aad]: marka koowaad 59 iyo 13

$59 \times 13 = 767$

Talaabada 2[aad] tiri wadarta guud ee godadka ka dambeeya barta jajabtobanlaha labada jajabtoanleba, waxaa jira 4 god oo ka dambeeya barta jajabtobanlaha labada tiroba.

Hadaba, tarantu waa inay lahaato 4 god oo ka dambeeya barta jajabtobanlaha.

Talaabada 3[aad]: $0.59 \times 0.13 = 0.0767$

j) talaabad 1[aad]: $612 \times 2 = 1224$

dabadeed, 0.00612×2

talaabada 2[aad]: waxaa jira 5 god oo ka dambeeya barta jajabtobanlaha.

Hadaba, taranta waa inay jiraan 5 god oo ka dambeeya barta jajabtoban laha talaabada sedexaad:

$0.00612 \times 2 = 0.01224\backslash$

x) 0.861×0.121

talaabada 1[aad]: $861 \times 121 = 104181$

talaabada 2[aad]: waxaa jira 6 god oo ka dambeeya barta jajabtobanlaka

talaabada 3[aad]: $0.861 \times 0.121 = 0.104181$

3. b) $0.75 \times \frac{2}{3} = \frac{0.75 \times 100}{100} \times \frac{2}{3} = \frac{75}{100} \times \frac{2}{3} = \frac{150}{300} = \frac{1}{2}$

t) $0.5 \times \frac{1}{2} = \frac{0.5 \times 10}{10} \times \frac{1}{2} = \frac{5}{10} \times \frac{1}{2} = \frac{5}{20} = \frac{1}{4}$

j) $0.675 \times \frac{1}{4} = \frac{0.675 \times 100}{1000} \times \frac{1}{4} = \frac{675}{1000} \times \frac{1}{4} = \frac{675}{4000} = \frac{25}{160} = \frac{5}{32}$

x) $0.5 \times \frac{21}{20} = \frac{0.5 \times 10}{10} \times \frac{21}{20} = \frac{5}{10} \times \frac{21}{20} = \frac{105}{200} = \frac{21}{40}$

kh) $0.35 \times \frac{1}{7} = \frac{0.35 \times 100}{100} \times \frac{1}{7} = \frac{35}{100} \times \frac{1}{7} = \frac{35}{700} = \frac{1}{20}$

4. b) 10% ee $60 = \frac{10}{100} \times 60 = 6$

t) $\frac{5}{9}\%$ ee $27 = \frac{5}{900} \times 27 = \frac{5}{100} \times 3 = \frac{3}{20}$

j) $\frac{4}{5}\%$ ee $\frac{2}{7} = \frac{4}{5} \times \frac{1}{100} \times \frac{2}{7} = \frac{1}{5} \times \frac{1}{25} \times \frac{2}{7} = \frac{2}{875}$

x) Taranta $\frac{4}{5}$ iyo $\frac{15}{16}$, waa $\frac{3}{4}$

3.5.2 Isuqeybinta jajabayda iyo jajabtobanleyaasha

Adigoo ku bilaabaya hawlgalka 3.10, sidaad horeba u sameyn jirtay ugu wareeg fasalka si aad u dhiirigaliso ama aad u caawisid ardayda. Markay hawlgalka dhammeeyaan ardayda waxaad u ogolaan kartaa inay so jeediyaan waxay ka heleen shaqadii ay qabteen u sax ardayda tusna sida laysugu qeybiyo laba jajab, jajabtobanle, jajabtobanle kale iyo jajab iyo jajabtobanle. Sii qaaciidada guud ee jajabyada laysugu qeybiyo, waxaa u sharixi kartaa adigoo isticcmaalaya tusaalaha 4, 5, iyo 6 qormo-saynis ahaan ku caawi ardayda si ay ugu qoraan tiro tirsiimo oo lagu siiyey qormo saynis u sharax arintan adigoo isticmasalaya tusaalaaha 7 ee lagugu siiyey bogga 31 weydii ardayda hadday la kulmeen wax dhibaato ah qorida qormo sayniska.

Qiimeyn

Waad qiimeyn kartaa ardayda fahamkooda markay ka shaqeynayaan hawlgalada, soo jeedi waxay qabteen waxaad siin kartaa shaqo fasal adigoo dooranaya su'aalo aad ka xulato layliska 3.9 waxaad u siin kartaa laylis ahaan 3.9 iyo 3.10 waxad u siin kartaa shaqo guri, hubina shaqadooda.

Hawlgalka 3.10

1. Haa $\frac{1}{2}$ ee $\frac{1}{2} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

   $\frac{1}{4}$ waa jajab u taagan badhka badhkiisa.

2. $\frac{1}{4} = \frac{1}{2}$ ee $\frac{1}{2}$

3. $\frac{1}{2} \div \frac{2}{5} = 0.5 \div 0.4 = 1.25$

4. $\frac{1}{2}\times\frac{5}{2}=\frac{5}{4}=1.25$

5. Waa isku mid, haa $\frac{1}{2}\div\frac{2}{5}=\frac{1}{2}\times\frac{5}{2}=\frac{5}{4}$

6. b) $\frac{12}{25}\div\frac{4}{5}=0.48\div0.8=\frac{0.48}{0.8}=\frac{0.48\times100}{0.8\times100}=\frac{48}{80}=\frac{6}{10}=\frac{3}{5}$

   t) $\frac{12}{25}\times\frac{5}{4}=\frac{60}{100}=\frac{6}{10}=\frac{3}{5}$

   j) $\frac{12}{25}\div\frac{4}{5}=\frac{12}{25}\times\frac{5}{4}$

7. $0.125\div0.35=\frac{0.125}{0.35}=\frac{0.125\times1000}{0.35\times1000}=\frac{125}{350}=\frac{5}{14}$

Jawaabaha layliska 3.9

1. b) $\frac{1}{5}\div\frac{3}{10}=\frac{1}{5}\times\frac{10}{3}=\frac{10}{15}=\frac{2}{3}$

   t) $\frac{3}{4}\div\frac{1}{3}=\frac{3}{4}\times\frac{3}{1}=\frac{9}{4}$

   j) $\frac{3}{4}\div\frac{1}{6}=\frac{3}{4}\times\frac{6}{1}=\frac{18}{4}=\frac{9}{2}$

   x) $2\div1\frac{1}{3}$

   Marka 1^{aad} aan u bedelno tirada dhafan ee $1\frac{1}{3}$ jajab-ma qumane.

   $1\frac{1}{3}=1\frac{1}{3}=\frac{3\times1+1}{3}=\frac{4}{3}$

   Sidaas darteed $2\div1\frac{1}{3}=2\div\frac{4}{3}=2\times\frac{3}{4}=\frac{6}{4}=\frac{3}{2}$

   kh) $3\frac{1}{2}\div\frac{1}{3}$, marka 1^{aad} tirada dhafan ee $3\frac{1}{2}$ aan u badalno jajab ma qumane $3\frac{1}{2}=3+\frac{1}{2}=\frac{3\times2+1}{2}=\frac{7}{2}$

   Sidaas darteed, $3\frac{1}{2}\div\frac{1}{3}=\frac{7}{2}\div\frac{1}{3}=\frac{7}{2}\times\frac{3}{1}=\frac{21}{2}$

d) $\frac{7}{10} \div \frac{3}{20} = \frac{7}{10} \times \frac{20}{3} = \frac{7 \times 20}{10 \times 3} = \frac{140}{30} = \frac{14}{3}$

2. b) $2.3 \div 10$

$= \frac{2.3 \times 10}{10} \div 10 = \frac{23}{10} \div 10 = \frac{23}{10} \times \frac{1}{10} = \frac{23}{100}$

t) $3.6 \div 100 = 3.6 \div \frac{1}{100} = \frac{3.6}{100} = 0.036$

j) $9.6 \div 0.96$

$9.6 = \frac{9.6 \times 10}{10} = \frac{96}{10}$

$0.96 = \frac{0.96 \times 100}{100} = \frac{96}{100}$

$9.6 \div 0.96 = \frac{96}{10} \div \frac{96}{100} = \frac{96}{10} \times \frac{100}{96} = \frac{9600}{960} = 10$

x) $3.2 \div 4$

$3.2 = \frac{3.2 \times 10}{10} = \frac{32}{10} = \frac{16}{5}$

Sidaas darteed $3.2 \div 4 = \frac{32}{10} \div 4 = \frac{32}{10} \times \frac{1}{4} = \frac{32}{40} = \frac{8}{10} = \frac{4}{5}$

kh) $0.354 \div 5.004 = \frac{0.354}{5.004} = \frac{0.354 \times 1000}{5.004 \times 1000} = \frac{354}{5004} = \frac{59}{834}$

d) $0.042 \div 6 = 0.042 \times \frac{1}{6} = \frac{0.042}{6} = \frac{0.042 \times 1000}{6 \times 1000}$

$= \frac{42}{6000} = \frac{21}{3000} = \frac{7}{1000}$

r) $52.5 \div 5.5 = \frac{52.5}{5.5} = \frac{52.5 \times 10}{5.5 \times 10} = \frac{525}{55} = \frac{105}{11}$

3. b) $6 \div \frac{1}{2} = 6 \times \frac{2}{1} = 12$

t) $0.4 \div \frac{1}{4} = \frac{4}{10} \div \frac{1}{4} = \frac{4}{10} \times \frac{4}{1} = \frac{16}{10}$

j) $\frac{1}{2} \div \frac{3}{5} = \frac{1}{2} \times \frac{5}{3} = \frac{5}{6}$

x) $\frac{4}{7} \div \frac{16}{21} = \frac{4}{7} \times \frac{21}{16} = \frac{84}{112} = \frac{3}{4}$

kh) $1.25 \div 0.05 = \frac{1.25}{0.05} = \frac{1.25 \times 100}{0.05 \times 100} = \frac{125}{5} = 25$

d) $5 \div 2.5 = \frac{5}{2.5} = \frac{5 \times 100}{2.5 \times 10} = \frac{50}{25} = 2$

r) $10 \div \frac{1}{5} = 10 \times \frac{5}{1} = 50$

s) $\frac{4}{5} \div \frac{2}{5} = \frac{4}{5} \times \frac{5}{2} = \frac{20}{10} = 2$

sh) $\frac{2}{3} \div \frac{16}{24} = \frac{2}{3} \times \frac{24}{16} = \frac{48}{48} = 1$

4. b) $35 = 3.5 \times 10$

t) $105 = 1.05 \times 10^2$

j) $2005 = 2.005 \times 1000 = 2.005 \times 10^3$

x) $191 = 1.91 \times 100 = 1.91 \times 10^2$

kh) $8900 = 8.9 \times 1000 = 8.9 \times 10^3$

Jawaabaha layliska Nakhtiinka cuttubka 3aad

1. b) $\frac{3}{6} = \frac{1}{2}$ t) $\frac{2}{5}$ j) $\frac{2}{6} = \frac{1}{3}$

2. b) $\frac{18}{10}$

Talaabada 1aad: IWM (18, 10) = 2
Talaabada 2aad: 18 marka loo qeybiyo 2 waxaad heli 9.
Talaaada 3aad: 10 markaad u qeybiso 2 waxaad heli 5.
Talaabada 4aad: jajabka cusubi waa $\frac{9}{5}$ sidaas darteed $\frac{18}{10} = \frac{9}{5}$

t) $\frac{24}{42}$

talaabada 1[aad]: IWM (24, 42) = 6
talaabada 2[aad]: 42 marka loo qeybiyo 6 waxaad heli 7.
talaabada 3[aad]: 24 markaad u qeybiso 6 waxaad heli 4.
Talaabada 4[aad]: jajabka cusubi waa $\frac{4}{7}$

$\therefore \frac{24}{42} = \frac{4}{7}$

j) $\frac{9}{36}$

talaabada 1[aad]: IWM (9, 36) = 9
talaabada 2[aad]: 9 markaad u qeybiso 9 waxaad heli 1
talaabada 3[aad]: 36 markaad u qeybiso 9 waxaad heli 4.
Talaabada 4[aad]: jajabka cusubi waa $\frac{1}{4}$

$\therefore \frac{9}{36} = \frac{1}{4}$

x) $\frac{55}{77}$

talaabada 1[aad]: IWM (55, 77) = 11
talaabada 2[aad]: 55 marka loo qeybiyo 11 waxaad heli 5.
Talaabada 3[aad]: 77 marka loo qeybiyo 11 waxaad heli 7.
Talaabada 4[aad]: jajabka cusubi waa $\frac{5}{7}$, $\because \frac{55}{77} = \frac{5}{7}$

Kh) $\frac{21}{28}$ talaabada 1[aad]: IWM (21, 28) = 7
talaabada 2[aad]: 21 marka loo qeybiyo 7 waxaad heli 3.
Talaabada 3[aad]: 28 marka loo qeybiyo 7 waxaad heli 4.
Talaabada 4[aad]: jajabka cusubi waa $\frac{3}{4}$ sidaa darteed, $\frac{21}{28} = \frac{4}{7}$

d) $\frac{48}{84}$

talaabada 1[aad]: IWM (48, 84) = 12
talaabada 2[aad]: 48 marka loo qeybiyo 12 waxaad heli 4
talaabada 3[aad]: 84 marka loo qeybiyo 12 waxaad heli 7

talaabada 4[aad]: jajabka cusubi waa $\frac{4}{7}$

$\because \frac{48}{84} = \frac{4}{7}$

r) $\frac{18}{20}$

talaabada 1[aad]: IWM (18, 20) = 2

talaabada 2[aad]: 18 marka loo qeybiyo 2 waxaad heleysaan 9.

talaabada 3[aad]: 20 marka loo qeybiyo 2 waxaad heli 10

talaabada 4[aad]: jajabka cusubi waa $\frac{9}{10}$

$\because \frac{18}{20} = \frac{9}{10}$

3. b) $\frac{15}{20}$

IWM (15, 20) = 5, haddaba jajabka $\frac{15}{20}$ uma qorna heerkiisa ugu hooseeya

t) Maadaama IWM (6, 9) = 3, jajabka $\frac{6}{9}$ uma qorna heerkiisa ugu hooseeya.

j) $\frac{1}{3}$ waa jajab u qoran heerkiisa ugu hooseeya, waayo IWM (1, 3) = 1

x) $\frac{13}{24}$ waa jajab u qoran heerkiisa ugu hooseeya waayo,IWM (13, 24) = 1

kh) IWW (64, 72) = 8 dabadeed jajabka $\frac{64}{72}$ uma qorna heerkiisa u hooseeya

d) $\frac{14}{15}$ waa jajab u qoran heerkiisa ugu hooseeya, waayo IWM (14, 15) = 1

r) $\frac{9}{10}$ waa jajab u qoran heerkiisii ugu hooseeyey, waayo IWW (9, 10) = 1

s) $\frac{5}{6}$ waa jajab u qoran heerkiisa ugu hooseeya, waayo IWM (5, 6) = 1

sh) IWW (39, 52) = 13, hadaba jajabka $\frac{39}{52}$ uma qorna heerkiisa u hooseeya.

4.

	Jajabtobanle	jajab	boqolkiiba
b	0.2	$\frac{1}{5}$	20%
t	0.4	$\frac{2}{5}$	40%
j	0.51	$\frac{51}{100}$	51%
x	3.25	$\frac{13}{4}$	325%
kh	0.85	$\frac{17}{20}$	85%
d	0.08	$\frac{2}{25}$	8%
r	0.35	$\frac{7}{20}$	35%
s	0.125	$\frac{1}{8}$	12.5%
sh	0.625	$\frac{5}{8}$	62.5%
dh	1.00	1	100%
c	0.375	$\frac{3}{8}$	37.5%

5. b) $\frac{1}{10} = 0.1$

t) $\frac{8}{10} = 0.8$

j) $\frac{4}{10} == 0.4$

x) $\frac{3}{5} = 0.6$

kh) $\frac{19}{20} = 0.95$

d) $\frac{3}{50} = \frac{3\times 2}{50\times 2} = \frac{6}{100} = 0.06$

r) $\frac{39}{50} = \frac{39\times 2}{50\times 2} = \frac{78}{100} = 0.78$

s) $\frac{17}{25} = \frac{17\times 4}{25\times 4} = \frac{68}{100} = 0.68$

6. b) $15.5\% = \frac{15.5}{100} = \frac{15.5\times 10}{100\times 10} = \frac{155}{1000} = \frac{31}{200}$

t) $7.5\% = \frac{7.5}{100} = \frac{7.5\times 10}{100\times 10} = \frac{75}{1000} = \frac{3}{40}$

j) $0.5\% = \frac{0.5}{100} = \frac{0.5\times 10}{100\times 10} = \frac{5}{1000} = \frac{1}{200}$

x) $17.3\% = \frac{17.3\%\times 10}{100\times 10} = \frac{173}{1000} = \frac{173}{1000}$

kh) $45\% = \frac{45}{100} = \frac{9}{20}$

d) $0.05\% = \frac{0.05}{100} = \frac{0.05\times 100}{100\times 100} = \frac{5}{10,000} = \frac{1}{2000}$

7. b) $\frac{19}{100} = 19\%$ t) $\frac{43}{100} = 43\%$

j) $\frac{7}{10} = \frac{7\times 10}{10\times 10} = \frac{70}{100} = 70\%$

x) $\frac{19}{25} = \frac{19\times 4}{25\times 4} = \frac{76}{100} = 76\%$

kh) $\frac{7}{20}=\frac{7\times5}{20\times5}=\frac{35}{100}=35\%$

8. b) $\frac{1}{4}<\frac{1}{2}<\frac{2}{3}<\frac{3}{4}$ t) $\frac{1}{2}<\frac{4}{7}<\frac{5}{8}<\frac{3}{4}$

j) $\frac{7}{10}<\frac{7}{9}<\frac{3}{4}<\frac{5}{6}$ x) $\frac{1}{4}<\frac{7}{20}<\frac{9}{25}$

9. b) $\frac{4}{5}>\frac{7}{10}>\frac{1}{2}>\frac{2}{6}$ t) $\frac{3}{4}>\frac{5}{8}>\frac{3}{5}>\frac{1}{2}$

j) $\frac{4}{6}>\frac{7}{12}>\frac{1}{2}>\frac{9}{20}$

10. b) $1\frac{1}{2}+\frac{4}{9}$ marka 1[aad] tirada dhafan u bedel jajab ma qumane.

$1\frac{1}{2}=1+\frac{1}{2}=\frac{2\times1+1}{2}=\frac{3}{2}$

Sidaas darteed $1\frac{1}{2}+\frac{4}{9}=\frac{3}{2}+\frac{4}{9}=\frac{3\times9+4\times2}{2\times9}=\frac{27+8}{18}=\frac{35}{18}$

t) $2+\frac{5}{8}+\frac{7}{8}=\left(2+\frac{5}{8}\right)+\frac{7}{8}$

$=\frac{2\times8+5}{8}+\frac{7}{8}=\frac{21}{8}+\frac{7}{8}=\frac{28}{8}=\frac{14}{4}$

j) $\frac{1}{4}+\frac{1}{3}+\frac{1}{2}=\left(\frac{1}{4}+\frac{1}{3}\right)+\frac{1}{2}$

$\left(\frac{1\times3+4\times1}{4\times3}\right)+\frac{1}{2}=\frac{7}{12}+\frac{1}{2}=\frac{7\times1+1\times6}{12}=\frac{13}{12}$

x) $3\frac{2}{3}-1\frac{3}{4}$ marka hore tirada dhafan u bedel jajab maqumane

$3\frac{2}{3}=3+\frac{2}{3}=\frac{3\times3+2}{3}=\frac{11}{3}$

$1\frac{3}{4}=1+\frac{3}{4}=\frac{4\times1+3}{4}=\frac{7}{4}$

Sidaas darteed $\frac{11}{3}-\frac{7}{4}=\frac{11\times4-3\times7}{3\times4}=\frac{44-21}{12}=\frac{23}{12}$

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

d) $\frac{3}{4}-\frac{3}{8}=\frac{3\times8-4\times3}{4\times8}=\frac{24-12}{32}=\frac{12}{32}=\frac{3}{8}$

r) $\frac{7}{10}-\frac{3}{5}=\frac{7\times5-10\times3}{5\times10}=\frac{35-30}{50}=\frac{5}{50}=\frac{1}{10}$

s) $\frac{3}{4}\times\frac{5}{5}=\frac{15}{20}=\frac{3}{4}$

sh) $\frac{7}{6}\times\frac{2}{5}=\frac{7\times2}{6\times5}=\frac{14}{30}=\frac{7}{15}$

dh) $\frac{3}{5}\times\frac{25}{6}=\frac{3\times25}{5\times6}=\frac{75}{30}=\frac{15}{6}=\frac{5}{2}$

c) $\frac{2}{3}\times\frac{6}{5}\times\frac{15}{2}=\frac{2\times6\times15}{3\times5\times2}=\frac{180}{30}=6$

g) 1.27 + 5.063

+1.270
5.063
6.333

f) 4.5 + 1.83

+4.50
1.83
6.33

q) 0.009 + 0.435

+0.009
0.435
0.444

k) 5.063 – 1.27

–5.063
1.270
3.793

l) 4.5 – 1.83

+4.50
1.83
2.67

m) 1 – 0.999

+1.000
0.999
0.001

n) 6.3 × 0.9

talaabada 1aad: $63 \times 9 = 567$

talaabada 2aad: waxaa jira laba god oo ka dambeeya barta jajabtobanlaha sidaas darteed waa inay jiraan taranta laba god oo ka dambeeya barta jajabtobanlaha.

$\therefore 6.3 \times 0.9 = 5.67$

w) 0.04×0.004

talaabada 1aad: $4 \times 4 = 16$

talaabada 2aad: waxaa jira 5 god oo ka dambeeya barta jajabtobanlaha, haddaba waa inay jiraan taranta dhexdeeda 5 god oo ka dambeeya barta jajabtobanlaha sidaas darteed, $0.04 \times 0.004 = 0.000166$.

h) $0.4 \times 0.3 \times 0.028 = (0.4 \times 0.3) \times 0.028$

$= (0.12) \times (0.028) = 0.00336$

11. b)

$3\frac{1}{2}$	6	$5\frac{1}{2}$
7	5	3
$4\frac{1}{2}$	4	$6\frac{1}{2}$

Dhammaystirka jog u taxyada iyo jiif u taxyada iyo xagala – gooyayaasha oo ay dhammaantoodu wadartooda tahay isku mid.

Aan u qaadano tix raac xagal – gooyaha buuxa wadartiisuna tahay 15.

i. Joog u taxa midig

$L + 3 + 6\frac{1}{2} = 15$

$L + 9\frac{1}{2} = 15$

$L = 15 - 9\frac{1}{2}$

$L = 5\frac{1}{2}$

ii. Jiif u taxa sare

$3\frac{1}{2} + k\,5\frac{1}{2} = 15$

$9 + k = 15$

$k = 15 - 9$

$k = 6$

iii. Joog u taxa dhexe

$6 + J + w = 15$

$11 + w = 15$

$w = 15 - 11$

$w = 4$

iv. Jiif u taxa hoose

$n + 4\ 6\frac{1}{2} = 15$

$n + 10\frac{1}{2} = 15$

$n = 15 - 10\frac{1}{2}$

$n = 4\frac{1}{2}$

v. Jiif u taxa dhexe

$m + 5 + 3 = 15$

$m + 8 = 15$

$m = 15 - 8$

$m = 7$

CUTTUB 4 ABYOONAYAASHA

HORDHAC

Abyoonayaashu waa tirooyinka ugu horeeya ee uu qofkastaaba uu u barto in uu u isticmaalo isticmaalkooda, maalin kasta la isticmaalo darteed. Abyoonayaashu waxay ka samaysan yihiin kooxo, kuwaas oo tirooyin kale laga soo dhiraan-dhiriyay.

Ujeedada cutubkani waa in la fahmo waxaan u jeedno maarkaan leenahay abyoonayaasha, tirooyinka Togan iyo kuwa Taban, tiro kasoo horjeedkeeda xariiqda tirada iyo calaamadaha sida qaar ka mid ah cutubyadii hore, tani waa markii u horaysay ee ay noqotay in ardayda la baro wax ku saabsan ka soo horjeedka tiro (rogaal) iyo tirooyinka calaamadaha wata sida tirooyinka togan iyo taban. Sidaas darteed dadaal iyo taxadar gaar ah oo ay la socdaan laylisyo lagu cel-celiyo waa in la sameeyo sidaas daraadeed ardaydu waxay u yeelan doonaan abyoonayaasha aas-aas fiican.

Cutubkanisidoo kale waxaa loo diyaariyay ardayda in fikradaha sida tirooyinka calaamadaha wata (sida tirooyinka taban iyo kuwa togan) uu siiyo ayadoo laga bilaabayo ta ugu yar ilaa ta ugu wayn, ayada oo laga bilaabaya ta ugu wayn ilaa ta ugu yar, iyada oo la isticmaalayo xariiqda tirada iyo iyada oo la siticmaalayaba ardayda sidoo kale waa in laga caawiyo siday u garan lahaayeen sida la isku bar-bardhigo, laba abyoone iyo sida la iskugu geeyo iyo sida loo kala gooyo Abyoonayaasha kuwa isku midka ah iyo kuwa aan isku midka ahaynba.

Waxaa kale oo loo baahan yahay in arday kasta laga caawiyo, lagu dhiiri galiyo sidii uu fikradaha Abyoonayaasha iyo xaaladaha nolosha dhabta ah uu iskula xidhiidhin lahaa.

UJeedooyinka Cutubka

Cutubkani marka uu dhamaado dabadeed ardaydu waxa ay awoodi doonaan inay:-

- *Qeexaan ururka Abyoonayaasha*
- *Ay sifiican u cadeeyaan faraqa u dhexeeya ururka tirooyinka tirsiimo, ururka tirooyinka idil iyo ururka Abyoonayaasha.*

- *Qeexaan tirooyinka taban iyo kuwa togan*
- *Isu geeyaan laba abyooneyaal, kana gooyaan hal abyoone ku kale*
- *Ku muujiyaan abyoone kasta xariiqda tirada dusheeda*
- *Isticmaalaan xariiqda tirada si ay isugu geeyaan una kala gooyaan Abyoonayaasha.*
- *U qoraan Abyoonayaasha sida ay u kala horeeyaan iyagoo ka bilaabaya ka u yar ilaa ka u wayn iyo iyaga oo ka bilaabaya ka u wayn ilaa ta u yar, iyada oo la isticmaalayo xariiqda tirada iyo iyada aan la isticmaalaynba.*
- *Isbarbardhigaan laba ama in ka badan oo Abyoonayaal ah.*

4.1 BARASHADA ABYOONAYAASHA

Mudada loo qoondeeyay: 5 xiisadoo

Waxa laga rabo ardayga

Marka uu dhamaado cutub hoosaadka 4.1 Ardaydu waxa ay awoodi doonaan inay:

- *sharaxaan waxa uu yahay macnaha abyoonayaal*
- *ay isla xidhiidhiyaan (ku dabaqaan) fikradaha abyoonayaasha iyo nolol maalmeedkooda.*

Erayo Muhiimka ah

- Abyoonayaal, summadda Tognaanta (+), Summadda Tabnaanta (-), lidka tiro abyoon.

Hordhac

Intaynaan sharaxin qeexin macnaha Abyoonayaasha (qeexida 1 ee ku taala bogga 3 ee buuga ardayga) ka hor ardayda waxaad siin kartaa tusaalayaal la yaqaano oo ah siin iyo ka qaadid, macaash iyo khasaare, ka sareeya iyo ka hooseeya IWM. Sidoo kale waxaad siin tusaalayaalkale kuwaas oo la mid ah kuwa ku yaala (lagu siiyay buuga ardayga bogga 90^{aad}.

Gudbinta Cashirka

Ardayda waxaa laga filayaa inay fikrado ka haystaan ururka tirooyinka tirsiimo iyo ururka tirooyinka idil, ardaydaada waxaad ku boorinkartaa inay ka doodaan

- Tirooyinka tirsiimo iyo
- Muhiimada eber

Dabadeed waxaad bilaabi kartaa inaad barto Abyoonayaasha adigoo siinaya masalooyin la xidhiidha nolosha, waxaa kale oo aad siin kartaa tusaalayaasha lagugu siiyay booga 3 ee buuga ardayga. Sidoo kale waxaad isitcmaali kartaa tusaalayaasha noocyada soo socda:

Tusaalaha 1aad

Magacaw saadesx xaaladood oo nolosha la xidhiidha, taas oo Abyoonayaasha loo isticmaali karo

- Isticmaalida (kharasha) iyo qaadashada lacageed
- Kor u kicida iyo hoos u dhaca heer kulka
- Kordhinta hoos u dhaca dhibcaha tijaabada ah ka caawi ardaydaada inay keenaan tusaalayaal la xidhiidha xaaladaha Nolosha.

Tusaalaha 2aad

Abyoone ahaan side loogu qori karaa mid kasta oo ka mid ah kuwan soo socda?

- 16
- –55
- –283
- 250

Jawaabaha Layliska 4.1

b) 2 t) 0 j) maya

x) soo amaaho laba Birr oo kale

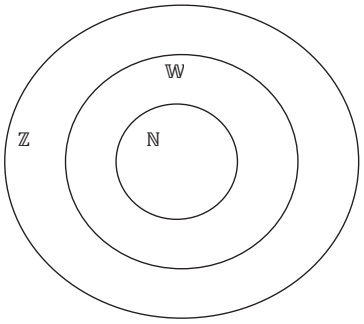
Jawaabaha hawlgalka 4.2

1.

Xaalada	Tiro ahaan
10 darajo ka saraysa eber	+10
Khasaare 10 birr ah	–10
7 dhibcood oo kor loo kaco	
3 talabo oo dib loo socdo	–3

2. Saacadu markay ahayd 5:00 Aroornimo heerkulku wuxuu ahaa –40℃. 9:30 am markay ahaydna heerkulku wuxuu ahaa + 11℃.

Jawaabaha shaqo kooxeedka 4.1

1. b) Heerkulka duhurka iyo ka-habeen bedkhka, keydsasho iyo kala-bixid lacageed, xagga hore oo loosocdo iyo xagga dambe oo loo noqdo, khasaare iyo faa'iido ganacsi iwm.
2. 15, –44, –9, 53, –88, –17, 37
3. 

Jawaabaha layliska 4.1

1. b) + 210 fuudh t) –162 mitir j) –12℃
   x) –100 Birr kh) +10 dhibcood d) –150 Birr
   r) +100Birr
2. b) –161 t) –73 j) –36℃ x) 0
   kh) +12℃ d) +16

4.2 ISBAR-BAR DHIGA IYO SIDA AY U KALA HOREEYAAN U QORIDA ABYOONAYAASHA

Mudada lii qoondeeyay: 5 xiidsadoo

Waxa laga rabo ardayga

Cutub hoosaadkan 4.2 marka uu dhamaado kadib ardaydu waxay awoodi doonaan in ay:-

- *qeexaan waxa uu yahay xariiqda tiradu*
- *u qoraan sida ay u kala horeeyaan iyo inay isbarbar dhigaan abyoonayaasha iyagoo isticmaalaya xariiqda tirada iyo iyagoon isticmaalaynba.*
- *caddeeyaan abyoone tirada ka horaysa iyo tirada ka dambaysa.*

Erayo Cusub

- Xariiq tiro, isbar-bar shig, siday u kala horeeyaan u qorid, tirooyin taban, tirooyin togan, ka horeeye iyo ka dambeeye(lagu xige iyo ku xige)

1. Xariiqda tirada waxaad ku bilaabi kartaa hadalkaaga ku bilaabi kartaa ururka tirooyinka tirsiimo iyo ururka tirooyinka idil (kaas oo ah ururka tirooyinka tirsiimo iyo eber) dabadeedna ka hadal kuwa lidka ku ah. Tirooyinkan dabadeedna sawir xariiq jiifta oo laba cidhif sida leebka ah(si ay inoogu sheegto in aanay labada cidhif midkoodna u dhamaanayn) una sheeg ardaydaada in ay tani ahayn xariiq la iska sameeyay eebalse ay tahay xariiq aan ku dul qori doono tirooyin si ay ugu taagnaato ururka Abyoonayaasha. Qiyaas bar badhtanka xariiqda, kuna qor bar si ay ugu taagnaato eber dhinaca midigta ka xigta eber ku qor, tirooyinkii tirsiimo siday isugu xigeen adigoo ka bilaabaya kow, una dhaxaysiinaya laba tiro tirsiimo fogaan isleeg, maxaa yeelay tirooyinka idili waxay ka bilaabmaan eber waxaana loo tiring xagga midigta, u sheeg ardaydaada in ay ku waasi yihiin Abyoonayaasha togan, Abyoonayaasha tabanina waxay ka bilaabmaan eber waxaana loo tiring dhinaca bidixda.

Tusaalaha 2aad

Sabuurada dusheeda ku qor -6, -2, 3, 0, -5, waydiina ardaydu in ay ku muujinyaan xariiqda tirada dusheeda, caawi ardayda adigoo u sheegaya in Abyoonyaasha togan ay lagamamaarmaan tahay in lagu qoro dhinaca midigta ka xiga eber, halka abyoonayaasha taban in lagu qoro bidixda ka xiga eber, sidoo kale u sheeg ardayda marka tirooyinka togan ay waynaadaan inay kordhayso. Halka marka tirooyinka tabani marka ay waynaadaan tiro ahaan ay hoos u dhacayso.

Isbabar- dhiga iyo siday iskugu xigaan, u qorida abyoonayaasha waxaad ku bilaabi kartaa doodaada adigoo u sheegaya ardayda in aad isticmaalno tiro wayn oo togan, in macnaheedu yahay qiimo wayn tirade markay waynaataba, markay badataba ama kor u kacdaba ama fogaataba, ama qaali noqotaba, ama tiro kasta oo u taaganba.

Laakiin marka ay xaaladu tahay tiro taban u sheeg ardaydaada in ay xusuustaan markasta oo ay tiradu waynaato in tiradu yaraanayso, waxaad siin kartaa tusaalayaal la xidhiidha nolosha dhabta ah oo la mid ah kuwa ku qoran bogga 9 ee buugga ardayga. Waxaa kale oo aad siin kartaa nooca tusaalahan soo socda oo kale.

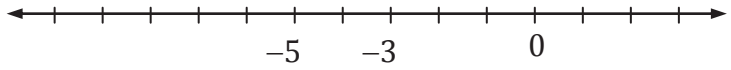
Tusaalaha 2aad

Isbar-bar dhig tirooyinka -4 iyo -2, sida kor ku xusan tirada wadata calaamada laga jaray waxaa lagu qori dhinaca bidixda ka xigta eber, tirada aan calaamadi ka muuqan waxaan u qaadan doona inuu togan yahay waxaa lagu qori dhinaca midigta ka xiga eber. Si la isku barbar dhigo laba ama in ka badan oo Abyoonayaal ardaydu waa in ay yaqaanaan in tirada ugu fog ee dhinaca midigta ee eber ay tahay ta ugu wayn, tirada ugu fod dhinaca bidixdana ee eberka ay tahay ta ugu yar.

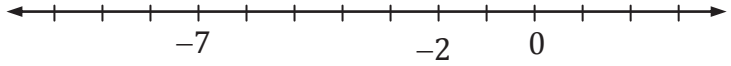
Hadda ardaydaada waxaad waydiin kartaa labada tiro ee lagu siiyay xariiqda dusheeda ayna sheegaan mid ka wayn.

Jawaabaha Hawlgalka 4.3

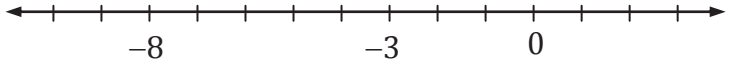
1. b. -5, -3, 0



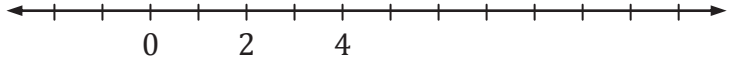
t. -7, -2, 1



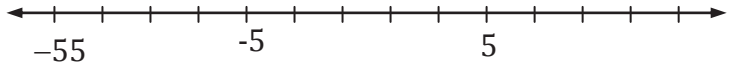
j. -8, -3, 0



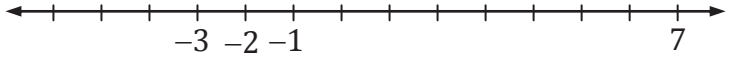
x. 0, 2, 4



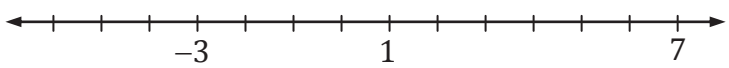
kh. -55, -5, 5



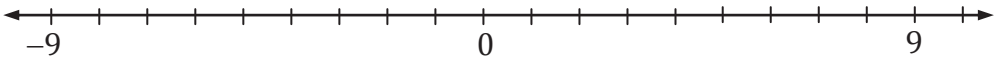
d. -3, -2, -1



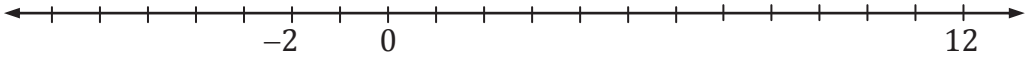
2. b. 7, 1, -3



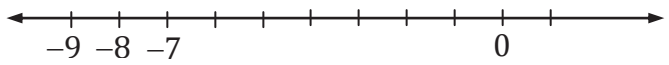
t. 9, 0, -9



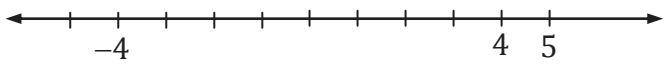
j. 12, 2, -2



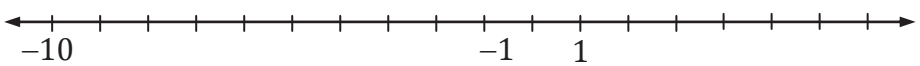
x. -7, -8, -9



kh. 5, 4, -4



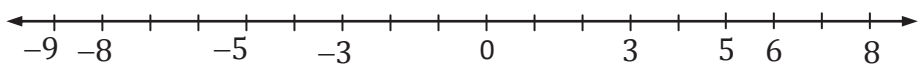
d. 1, -1, -10



Jawaabaha hawlgalka 4.4

Meere	Celceliska heerkulka
Fiinas	453° C
Meerkuri	179° C
Dhulka	8° C
Maaris	-37° C
jubitar	–150° C
Saturn	-185° C
Yuraanas	-214° C
Nebtuun	-225° C
Buluuto	-236° C

Jawaabaha layliska 4.2

1. 

2. b. -16 t. 7 j. 31 x. -18
3. b. -12, -11, -9, 0, 8, 12, 15 t. -13, -12, -7, -5, 0, 4, 6, 17
   j. -33, -31, -30, -28, 3, 27
4. b. 22, 21, 16, 14, 0, -8, -21 t. 24, 14, 10, 0, -14, -20, -22
   j. 11, 10, 9, -1, -9, -13, -19

4.3 ISUGAYNTA IYO KALA GOYNTA ABYOONAYAASHA

Waxa laga rabo ardayga

Dhammaadka cutub hoosaadkan 4.3 ardaydu waxay awoodi doonaan in ay:

- *helaan wadarta laba abyoonayaal iyagoo isticmaalaya xariiqda tirada iyo iyagoon isticmaalaynba.*
- *qeexaan asal ma-doorshaha iyo rogaalka isku gaynta ee abyoonayaasha.*

Erayo Cusub

- Isu gayn, kala goyn, wadar, faraq, asal ma-doorshaha isu gaynta, Rogaalka isu gaynta.

Waxaad ku bilaabi kartaa cutub hoosaadkan adigoo ardaydaasi si gacan ka qabasho ah inay u sheegaan faraqa u dhexeeya "calaamadaha isu gaynta " iyo "calaamdaha tognida" iyo sidoo kale faraqa u dhexeeya calaamada "laga jaray" iyo calaamada "Tabnida" waxaa kale oo aad ka doodi kartaa xeerarka laba tiro oo isku calaamda ah iyo xeerarka laba tiro oo calaamda kala duwan wata, si noocyada tusaalayaashan soo socda si ay ugu bartaan si gacan ka qabad ah isugaynta.

Tusaalaha 1aad

Raadi wadarta mid kasta oo kuwan soo socda ka mid ah:

b) (+ 5) + (+2) = 5+2 = 7

t) (+4) + (-3) = 4-3 = 1

j) (-6) + (+8) = -6+8= 2

Sidan si la mid ah ugu dooda xeerarka raadinta faraqa laba tiro oo leh calaamado isku mid ah iyo isku gaynta labo tiro oo leh calaamado kala duwan, marka labaad waxaad siin kartaa noocyada tusaalayaasha soo socda si ay gacan ka qabasho ugu sameeyaan kala goynta.

Tusaalaha 2aad

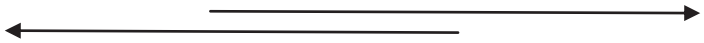
Raadi mid kasta oo ka mid ah kuwan soo socda:

b) (+6) –(+2) = 6-2 =4 t) (+7) –(-3) =7+3 =10

j) (-3) – (+4)= -3-4=-7 x) (-2) –(-7) = -2+7=5

Ardaydu waa in ay xusuustaan in marka ay isu geeyaan ay tiriyaan dabadeed waxay heli in ka badan, marka ay kala jaraana dib ha u tiriyaan waxay helayaan tiro yar, waxaa kale oo loo baahan yahay in ay xusuustaan in marka ay isticmaalayaan xariiqda tirada qiimaha tiradu wuu waynaan marka uu u socdo dhinaca midigta,

Qiimaha tiradu wuu yaraan marka ay u socdaan dhinaca bidixda.



Jawaabaha Hawlgalka 4.5

1. Maadaama oo aad haysato 35birr kaliya laakiin aad u baahan tahay 63birr si aad ugu iibsato buug waxaad u baahan tahay lacag kale, haddaba lacagta aad u baahan tahay waxaa lagu soo saari 63 – 35, dabadeed waxaad u baahan tahay 28birr.
2. 73 -44 =29.

3. Faraqa u dhexeeya heerkulka sare iyo heerkulka hoose waxaa lagu xisaabin karaa wadarta labada qiime ee 27 iyo 8 kuwaaso noqon doona 35, ogow in taasi ahayd xaalada marka aan xisaabino foganta sare (qotonka) ee u dhaxaysa buurta ras dhaashen iyo Danakil caddadiskoodo.

Jawaabaha hawlgaka 4.6

1. b) 0 t) 3 j) –3

Dabadeed marka aad ardayda ku dhiiri galisid in ay ka qayb qaataan dooda muxuu noqon doonaa maxsuulku marka eber loo geeyo Abyoone kasta, qeexna in eber yahay asal ma doorshaha isu gaynta. Dabadeedna sidaasi si la mid ah in ay raadiyaan wadarta laba abyoone oo isku lid ah, sii nooca tusaalayaashan soo socda oo kale.

Tusaalaha 3aad

Raadi wadarta mid kasta oo ka mid ah kuwan soo socda.

b) (+3) + (-3)=3-3 =0 t) (-5) + (+5) = -5+5 =0
j) 0+0 = 0

Doodan xagga sare ku xusan kadib qeex rogaalka isku gaynta Abyoonayaasha. Haddaba ardayda waydii inay sharaxaan isku mid ahaan shahan labadan tibaaxood a-b iyo a+ (-b), sii tusaalayaal kala duwan si aad u tusto a-b iyo a+(-b) inay leedahay fur-furis isku mid ah.

Tusaalaha 4aad

Raadi wadarta iyo faraqa mid kasta oo ka mid ah kuwan soo socda:

b) 6-3 t) 6+ (-3) j) (-4) – (-6) x) (-4) + 6

Sidoo kale ardaydu haka doodaan isku mid ahaanshaha labadan tibaaxood ee soo socda; a –(-b) iyo a+b, mar labaad sii tusaalayaal kala duwan si aad u tusto a- (-b) iyo a+b inay ina siiyaan maxsuul isku mid ah.

Tusaalaha 5aad

Raadi wadarta iyo faraqa mid kasta oo ka mid ah kuwan soo socda;

b) 8-(-2) t) 8+2 j) (-3) – (-4) x) (-3) + 4

Jawaabaha layiska 4.3

1. b. 8, 4, 0, –3, –4, –9 t. 6, 2, 1, 0, –3, –5, –7, –11
   J. 12, 8, 6, 3, –3, –5, –8 x. 10, 7, 2, 0, –3, –5, –6, –7
2. b. 6 t. 12 j. 0 x. -3 kh. -14 d. -7
3. b. 9 t. -9 j. -8 x. 9 kh. -9 d. -7

4. b. 2, 4 t. -10, -8 j. 18, 20 x. -2, 0 kh. -11, -9 d. -1, 1

5. b. < t. > j. > x. < kh. = d. >
r. > s. > sh. >

6. b. -35 t. 9 j. -24 x. -16 kh. -3 d. 48

7. b. < t. < j. < x. > kh. <

Jawaabaha layliska nakhhtiinka cuttubka 4aa

1. 31℃
2. (–137) + (–91) = –228 mitir
3. 33 – 15 = 18
4.

Xaalad	Qiimaha tirada
9 darajo ka sareeya eber	+9
54 mitir ka sareeya heerka badan	+54
12 halbeeg oo loosocdo dhinac bidix ee xariiqda tirada	–12
Keyd lacag dhen 860 birr oo la dhigto Bangi	+860
Macahs dhan 45 birr	+45
Lidka 181	–181
8 helbeeg oo bodix looga socdo xariiqda tirada barta 1	–7

5. –14, –91, 65, –3, 12, 0, 23
6. b. –85, –43, –37, 16, 34, 36, 58
   t. –29, –27, –22, –10, –4, 0, 16, 19, 29
   j. –41, –22, –18, –14, –8, 12, 16, 20
   x. –53, –35, –31, –13, 41, 46, 48
7. b. 77, 33, 15, 11, –11, –19, –27, –41
   t. 72, 46, 42, 29, –1, –4, –13, –43
   j. 81, 31, 26, –5, –17, –63, –69
   x. 61, 55, 53, 40, 33, 9, –34, –45, –56
8. 8 – 11 = –3℃
9. b. 42 t. 41 j. –27
   x. –91 kh. 9 d. 58
10. b. –71 t. 30 j. 45
    x. –113 kh. 17 d. –50
11. b. 15 t. 8 j. –31
    x. 20 kh. 42 d. 55
12. b. < t. < j. < x. > kh. > d. =
13. b. 86 t. 18
14. b 509 + 476 = 985 sannadood

CUTTUB 5 ISLE'EGYADA TOOSAN, DHEELLIYADA XARIIQDA TOOSAN IYO SAAMIYADA

HORDHAC

Cuttubkani waxuuu muhimada saarayaa dooda ku sabsan fikradaha aasaasiga ah ee isle'egyada toosan, dheelliyada toosan kulamada iyo saamigalka qeyb hoosaad kasta waxaa jira hawlgallo, shaqo kooxeed iyo laylisyo. Dhammaadka cutubkan, waxaa jira laylis Nakhtiin ah laylis yadan tiro ahaan wey yar-yihiin, laakiin waxaa loo isticmaali karaa in lagu qiimeeyo. Aqoonta Ardayda iyo heerka fahankooda.

Ujeedooyinka cutubka

Marka cuttubku dhammaado dabadeed, Ardaydu waa inay awoodaan inay:

- *Horumariyaan xirfadahooda ay ku xalliyaan furfuraan isle'egyada toosan iyo dheeliyada toosan (ee qaabka $x + b = t$, $x + b > t$).*
- *Fahmaan macnaha saamigal quman iyo saamigal rogaal ah, kuna muujiyaan garaaf ahaan (sawir ahaan).*

5.1 FURFURISTA ISLE'EGYADA IYO DHEELIYADA TOOSAN EE FUDUD

Xiisadaha loo qoondeeyey: 7 xiisadood

Waxa laga raba Ardayga

Dhammaadka cuttub-hoosaadkan, ardaydu waa inay awoodaan inay:

- *hal-taLaabo horey u qaadaan furturista isleegyada toosan ee saansaantoodu tahay* $x + b = t$.
- *hal-talaabo horey u qaadaan furfurista dheeliyada toosan ee saansaantoodu yahay* $x + b > t$.

Eryao cusub

Isle'egta xariiqda toosan, dheelliga xariiqda toosan, horaadka doorsoomaha, ururka furfurista, isle'egyo isku-dhigma.

Hordhac

Qaybtan waxan ku soo baranay fasalkii 5^{aad} ee xisaabta. Sidaa darted heerkan ardaydu waxay u baahan yihiin inay guda-galaan fikradihii ay ku soo barteen fasalka 5^{aad} cuttub-hoosaadkan waxaa loo sii qeybiyaa laba cinwaan oo waaweyn. Furfurista isle'egyada toosan oohal-talaabo horey loo qaado waa qeybta koowaad iyo furfurista dheeliyada toosan oo hal-talaabo horey loo qaado oo ah qeybta labaad.

5.1.1 Furturista isle'egyada toosan oo hal-talaabo hore loo qaado

Casharkan is aad u bilowdo, ardayda u kooxee sidaad doonto, weydiina inay ka shaqeeyaan shaqo kooxeedka 5.1 ee lagugu siiyey buugga Ardayda ku boori ardayda, caawina si ay u helaan jawaabta su'aasha. Shaqo kooxeedkani wuxuu kaa caawin in aad dardar ama dareenkooda kiciso, siina Ardayda jaanis ama fursad ay ku xasuustaan (dib-ugu laabtaan) macnaha "jiritaan ka ku xidhnaanshaha horaadka furfurista doorsoomaha".

Jawaabaha Hawlgalka 5.1

1. b. Doorsoome waa xaraf ama summad u taagan hal ama in kabadan oo tirooyin ah.
   t. Isle'eg waa weedh laba-tibaaxood oo xisaabeed ay isku mid yihiin (ayna dhaxayso calaamada =)

j. Isle'egyo isku-dhigma: isle'egyada leh furfuris (xal) isku mid ah.

x. Isle'egta xariiqda toosan: waa isle'egta ay tibxaheeda ay ku jiraan doorsoomeyaal jibaarkoodu yahay hal-digirii (derejo) furfurista isle'egyada toosan ee x ee hal-talaabo lagu helaa waa isle'egyada leh saansaanta (qaabka) $x + b = t$, $b, t \in Q$.

kh. Horaadka Doorsoomaha: waa ururka kutirsaneyaashiisa loo qaato inay yihiin kuwa suurtogelka ah ee lagu beeleli karo Doorsoomaha ku jira xidhiidhka lagu siiyay.

d. Ururka furfurista: waa ururka ka kooban dhommaan furfurista (xalka) weedho furan. Sida: isle'eg ama dheelli.

2. b. {2} t. $\varnothing$ j. {2} x. {0} kh. {10} d. {1}

Qiimeyn

b. Ardayda u sharax macnayaasha, Raalligalin Furfurid ururka furfurista, si aad u xoojiso fahankooda u dir Layliska 5.1 iyo layliska 5.2 fasalka dhexdiisa.

Jawaabaha layliska 5.1

1. Weedhaha lagu siiyey waxay run yihiin haddi x ay la mid tahay oo kaliya

b. $\frac{3}{4}$ t. –5 j. 0.4 x. 0.4 kh. 6

Markaad ka doodaan su'aasha 2, waa inaad ardayda ka caawiso sidii ay uga doodi lahaayeen sherciyada qaab-bedelida "loo geeyo ama laga-gooyo tiro isku midah labada dhinac waxba iskama badalayaan isle'ekaantoodu" sida:

Haddi $b = t$, dabadeed $b + j = t + j$, marka $b, t, j \in Q$.

Intaa waxa dheer, in aanaad ka boodin in aad sheegta in isle'egyada isku-dhigmaa aanay hal ahayn hadda aan qaadano tusaale waxay ku xidhan tahay kala duwanaansha shakhsiyaadka.

2. b. $x - \frac{1}{2} = -\frac{7}{2}$

$x - \frac{1}{2} + \frac{1}{2} = -\frac{7}{2} + \frac{1}{2}$ (u gee $\frac{1}{2}$ dhinac kasta) $= -3$

Ama $x - \frac{1}{2} = -\frac{7}{2}$

$x - \frac{1}{2} - \frac{1}{2} = -\frac{7}{2} - \frac{1}{2}$ (ka goo $\frac{1}{2}$ dhinac kasta)

Sidaas darted, x = –3, $x-\frac{1}{2}=-\frac{7}{2}$ iyo $x-1=-4$

Waa isle'eg u dhiganta.

Ayadoo la isticmaalayo xeelad la midah.

t. $-x-3=4.5$, $x=-7.5$ iyo $-x+1=8.5$ wey isku-dhigmaan.

j. $y+\frac{3}{2}=-2, y=-\frac{7}{2}$ iyo $y-\frac{1}{2}=-4$ wey isku-dhigmaan.

x. $x=9$, $x-1=8$ iyo $x+3=12$ wey isku-dhigmaan.

3. b. ∅ t. {14} j. {0} x. {4} kh. ∅ d. ∅

4. –6

5.1.2 Furfurista hal-talaabo ka dib ee dheelliyada xariiqda toosan

Si aad u bilowdo qeybtan, waxaad weydiin kartaa su'aalo aad ugu kuur-galayso inaad ku qiimeyso heerkooda fahan ee dheelligii fasalkoodii 5^{aad} ee xisaabta. Isku day in aad u soo jeediso casharka si ugu suurta-galsan ee ugu fudud.

Jawaabaha hawlgalka 5.3

1.	b.	isle'eg	t.	dheeli	j.	dheelli
	x.	isle'eg	kh.	dheelli	d.	dheelli
2.	b.	been	t.	run	j.	run
	x.	run	kh.	run	d.	run

Qiimeyn

Markasta ka fikir waxa ugu yar ee ardayda looga baahan yahay inay barteen, taas oo laga rajaynayo ama la filayo ardayda marka qeybtani dhammaato

Isticmaal habab qiimeyneed oo kala duwan mid caadi ah iyo si aan caadi ahayn si aadu hesho jawaabcelin ku saabsan heerka fahamkood ee cinwaankan. Intaa ka dib shakshiyaadka ardayda ah caawi xilliga casharku socod.

Jawaabaha layliska 5.2

1. b. ∅ t. ℕ j. {1, 2, 3, 4, 5, 6, 7, 8} x. {–2, –1, 0, . . .}

2. b. {0} t) {1, 2, 3} j. {–5, –4, –3, . . .}
   x. ma laha xalin

3. b. ma'laha furfuris ama xalin
   t. waxay leedahay furfurista {4, 5, . . .}
   j. furfuristoodu waa tirooyinka tirsiimo
   x. malaha furfuris (xal)

4. i. b. {–5, –3, 0, 2} t. {–5, –3, 0, 2, 4}
   j. {–5, –3} x. {–5, –3, 0}

   ii. b. {0, 1, 2, 3} t. {0, 1, 2, 3, 4} j. ∅ x. {0}

5.2 KULANNADA

Xiisadaha looqoondeeyey: 6 xiisadood

Waxa laga rabo Ardayga

Dhammaadka cuttubka hoosaadkan, ardaydu waxay awoodi doonaan inay:

- *go'aamiyaan kulamada bar ku taala waaxda koowaad*
- *ku muujiyaan bar kulamadeeda lagu siiyey waaxda koowaad.*

Erayo cusub

Dhidib, waax, sallax, lammaane horsan, kullan, dhidibka-x, dhidika-y

Hordhac

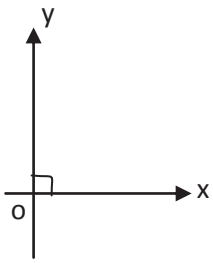
Cinwaan hoosaadkan waxaa ku baran doonaa habka kullamada (dhidibada kaartis). Macnayaasha qeybtan intooda badani Ardayda wey ku cusub yihiin. Sidaas darted waxa lagama maarmaan ah inaad hubiso in ardaydaada maskaxdooda ay si fiican u gashay macnaha ciwaaukani. Tusaale ahaan sida loo akhriyo macluumaadka, sida loogu muujiyo xidhiidhka qaab (saasaan) lammaaneyaal horsan ah.

Gudbinta casharka

Cuttub-hoosaadkan ardaydu waxay ka doodi doonaan kulamada ku dhacda waaxda koowaad iyo sida loogu muujiyo bar lagu siiyey kulamadeed sallaxa dhidibada-xy waqtiga intiisa badan, halkaad toos qeex xisaabeedka u bilaabi lahayd; waxa lagugula talinlahaa in aad ka bilowdo hawlgalka aanad ka doodaan muuqaal ahaan.

Jawaabaha hawlgalka 5.3

b.



t. mid j. 90° x. Afar

Jawaabaha hawlgalak 5.4

A (1, 7), B (2, 5), C (3, 6)

Markay dhammeeyaan shaqada hawlgalka, ardayda waxa laga yaabaa inay wax ka fahmaan xariiqyada isku-qotoma.

Barta kulanka (halka ay iska-jaraan) iyo Gobolada (waaxaha) dabadeedna waa inaad u gudubtaa barahan soo socda si aad uga doodaan. Ka soo qaad in OX iyo OY ay iska jaraan barta O.

1. OX waxaa la yidhaa dhibibka – x
2. OY waxaa la yidhaa dhidibka – Y
3. Marka labaduba laysku daro waxaa la dhahaa dhidibada laydiyeed, ama dhidibada=a kulanka.
4. Barta ay ska-jaraan O waxaa la dhahaa bar-biloga (xudun), aan qaadano in P tahay bar ku taala sallaxa dhidibada dusheeda xariiq P ka Timaada oo la yidhaa $\overline{PM} \perp \overline{OX}$ sawir, dabadeed,
   b. OM waxaa la dhahaa dhidibka-x ama abshisa P waxaano loo Qoraa X
   t. MP waxaa la dhahaa dhibibka-y ama ordhineed P waxaana loo qoraa Y.
   j. Tirooyinka X iyo Y waxaa la dhahaa kulamada P
   x. Summada P (x, y) waxaa loo isticmaala si loogu magacaabo barta P.

Qiimeyn

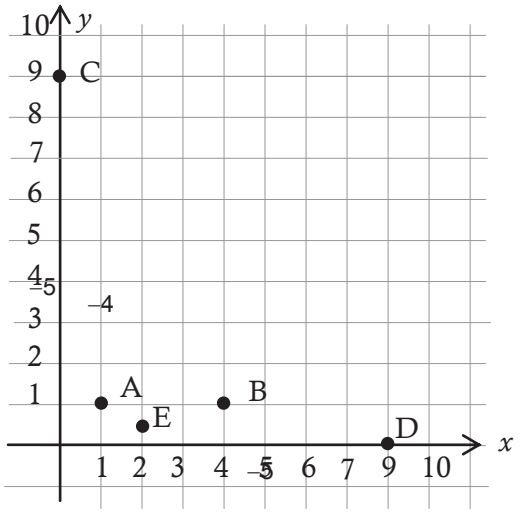
Waxaad ku qiimeyn kartaa

Adigoo siinaya layliska 5.3 su'aalaha 1, 2, 3, 4 shaqo fasal ahaan halka inta hadhay layliska aad ugu diri karto shaqo guri ahaan. Sida ugu suurto-galsan waa inaad u

raadiso su'aalo kale oo aankuwa buuga ahayn oo la midah iyo masalooyin aad ka raadiso buuggaagta kaleed kaga doodaan fasalka dhexdiisa.

Jawaabaha layliska 5.3

1. (0, 0) 2. 0 3. 0
4. A – dhidibka-x iyo dhidibka-y labadab
   B – dhidibka – y
   C – dhidibka – x



5. A(2, 2), B(5, 0), C(0, 3), D(1, 3)

5.3 SAAMIGALKA

Xiisadaha loo qoondeeyey: 12 xiisadood

Waxa ardayda laga rabo

Cinwaankani marka uu dhammaado, ardaydu waa inay awoodaan inay:

- *Sharaxaan saamiygalka quman iyo madoorsomaha saamigalka*
- *Go'aamiyaan madoorsoomaha (Isirka) saamigalka quman*
- *Ku dabakhaan aqoontooda saamigalka quman si ay u furfuran masalooyinka*
- *Sharaxaan saamigalka rogaal iyo madoorsoomaha (isirka) saamigalka.*
- *Go'aanshaan madoorsoomaha saamigalka rogaalka ah.*
- *Ku dabakhaan aqontooda saamigalka rogaalka si ay u xalliyaan masalooyinka.*

Erayo cusub

Saamigal, Saamigal quman, Saamigal rogaal ah, madoorsoomaha (Isirka) saamigalka

Hordhac

Cuttuub-hoosaadkani wuxuu muhimada saarayaa doodaha ku saabsan saamigalka quman, saamigalka. Rogaalka ah iyo Isirka saamigalka.

Tilmaan barahani wuxuu kuu sheegayaa waxyaalo ku saabsan hababka aad isticmaali lahyd si aad u gudbiso casharka, Intee ayaan xoogga saarnay, inteese u baahan in xoogga la saaro, haadaad habka casharka aad u gubinayso ka dhigta mid ardaydu ka qeybgalayaan, waxaad heli doontaa waqti kugu filan oo aad ku dhammayso cuttubka.

Gudbinta casharka

Cutub-hoosaadkan ardaydu waxay ka doodi doonaan saamigal iyo saamigal rogaal ah ayadoo sawir lagu muujin saamigalka quman iyo saamigal ka rogaalka ahna waa lagaga doodi doonaa.

5.3.1 Saamigalka quman

Waxaad casharka ku bilaabi kartaa adigoo ardayda weydiinaya inayka shaqeeyaan shaqo kooxeeda 5.2 shaqo kooxeedani ardayda waxay ka caawin doontaa inay naf-ahaandtoodu isu diyaariyaan dooda hadhow.

Dooda dhexdooda waa inaad Huubisaa in ardaydu barteen (la qabsadeen) Gabagabooy inkan soo socda ee muhiimka ah.

1. Qiimeyaasha x iyo y midba midka kale ayuu ku xidhan yahay, taasi waxay tahay qiimeyaashoodu hoos ayey u wada dhacaan si wada jirta ama kor ayey u kacaan si wad jirta.
2. Saamiga $\frac{y}{x}$ ama $\frac{x}{y}$, ee u dhexeeya qiimeyaasha isu-beegani isma badalo.

Jawaabaha hawlgalka 5.5

1. Haa
2. (a) xidhiidh joogto ah oo ah $\frac{1}{5}$
   (b) xidhiidh joogto ah oo ah 3.
3. wuu kordhayaa
4. hoos ayuu u dhacayaa (yaraanayaa).

Qiimeyn

Si aad u adkaysid (ay aad ugu fahmaan) macneyaasha ku muujisan (ama ku qoran) qeybtan, waxaa fiican in aad tusto (u sheraxdo) tusaaleyaal Fasalka dhexdiisa, waxaa kale oo aad siin kartaa masalooyin iyo su'aalo aad ka soo saarto buugta kale

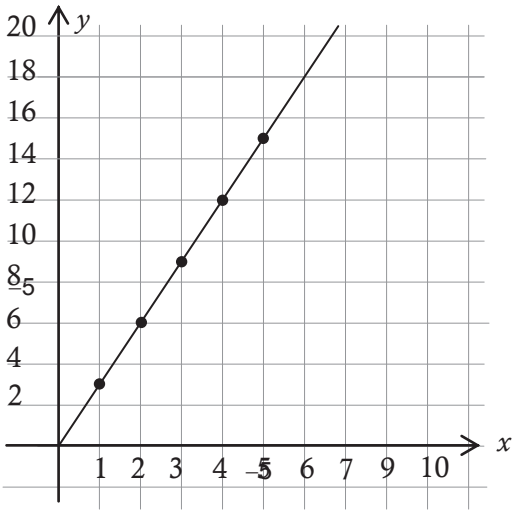
ee xisaabta ah, waxa kale oo aad siin kartaa shaqo guri ku dhiiri gali ardayda inay ku mujiyaan fikradaha saamigal qaman sawir ahaan.

Jawaabaha shaqo kooxeedka 5.2

b. haa

t. $y = 3x$

j



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d. xariiq toosan oo marta barta bilowga (xuduunta)

r. haa

Jawaabaha layliska 5.4

1. b iyo j ma'aha saamigal quman waayo ma jiro ma-doorsoomihii saamigalku.
2. Adigoo ka duuwlaya qiimaha x iyo y ee lagu siiyey, Go'aami marka hore qiimaha madoorsoomaha saamigalka.

   b. $k = \frac{2}{2} = 1$, sidaas darteed, qiimayaasha maqni waa 3, 4, 5, 8 siday isugu xigaan.

   t. $k = \frac{36}{7.2} = 5$, dabadeed

   $k = \frac{17}{2} \Rightarrow 5 = \frac{17}{b} \Rightarrow b = 3.5$

   $k = \frac{t}{4.6}$ $\quad k = \frac{28}{j}$ $\quad k = \frac{x}{9}$

   $5 = \frac{t}{4.6}$ $\quad 5 = \frac{28}{j}$ $\quad 5 = \frac{x}{9}$

   t = 23 $\quad$ j = 5.6 $\quad$ x = 45

   Sidaas si la mid ah, waxaad u habayn kartaa kuwa hadhay.

j. $k = \frac{17}{3.4} = 5$ qimayaasha maqani waa 23, 5, 6, 7.2, 45 sida ay isuguxigaan

$\Rightarrow b = \frac{5}{4}$ $t = \frac{7}{4}$ j = 24 x = 32 kh = 12

x. $k = \frac{240}{18} = 5$

$\Rightarrow$ b = 25 t = 7 j = 55 x = 90

3. Maadaama x ~ y, waxan haysanaa in y = kx $\Rightarrow$ 12 = k.8 k = 1.5

Sidaas darteed, lammaaneyaasha layna siiyey, haddan ku lammaanayno 15 iyo 20 inama siinayso madoorsoomaha saamigalka ee k = 1.5.

4.

Bed (m^2)	22	13
Xaddiga bacrimiyaha (gm)	682	y

Maddaama oo xaddiga bacrimiye ee loo baahan yahay in lagu bacrimiyo qiyaas bed uu saanigal quman ku yahay xaddiga beerta badabeed

b. $\frac{682}{22} = \frac{y}{13} \Rightarrow y = 13 \times \frac{341}{11} = 403\,gm$ t. $8m^2$

5. b. $k = 1.5$

x	5	8	9	13
y	7.5	12	13.5	19.5

k = 3

x	5	8	9	13
y	15	24	27	45

t. k = 1.5

x	2	8	16	30
y	3	12	24	45

k = 3

x	1	4	8	15
y	3	12	24	45

6. b. $k = \frac{C}{L} = \frac{60}{3} = 20$

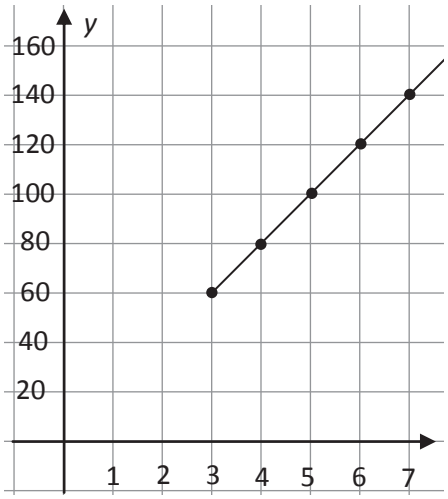
t. maadaama C ~ L, halka C = kL dabadeed, C = 20L

$C = 20 \times \frac{9}{2}$

C = 90 Birr

j. C = 20l

x.



5.3.2 Saamigal Rogaalka

Hadda ardaydu waxoogaa ilaa xad ayey ka yaqaanaan waxyaalo ku saabsan fikradaha saamiga iyo saamigalka quman, markaad ka doodaysaan qeybtan isticmaal hawlgal ay ka shaqeeyaan. Su'aalaha intooda badani waxaa loogu talo galay inay ardaydaada ka caawiyaan si ay u ursursadaan meelaha ugu muiimsan casharka.

Jawaabaha hawlgalka 5.6

1. b. x = 8 t. y = 2
2. b. hoos buu u dhacayaa

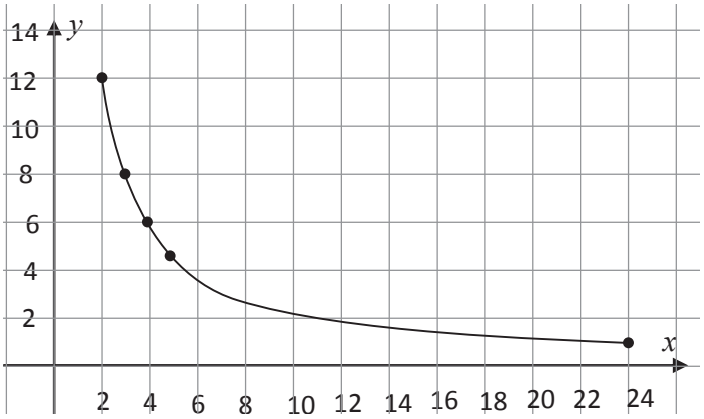
t. maya

j. haa, waxay noqoN 32 hawlgalkan marka laga tago, ku buuri ardayda inaad qoran tusaaleyasha ku qoran buugga ardayga.

Jawaabaha hawlgalka 5.7

b. haa, saamigalka rogaal

t.



Sawirka saamigalka rogaalka ahi ma'aha xariiq toosan, taas oo marta barta xudunta.

Qiimeyn

Si aad u caawiso ardaydaada xasuuso waxay ku soo barteen saamigal ka rogaalka adigoo samaynaya (dejinaya) su'aalo aasaasi ah. Bilow ahaan waxad isticmaali kartaa su'aalaha hoos lagugu siiyey.

1. Haddi xy = madoorsoome, dabadeed x iyo y waxaa la dhahaa waa ____ saamigal.
2. Coddee "tirada dadka iyo waqtiga ay ku dhammaynayaan shaqada" inay tahay saamigal quman iyo inay tahay saamigal rogaal ah?
3. Marka labada xaddi ee x iyo y ay yihiin saamigal rogaal ah, waxay u qoran yihiin _____.

Jawaabaha layliska 5.5

1. Maadaama y ku tahay saamigal rogaal ah x, waxaan haysanaa xy = k, dabadeed k = 5 × 40 = 200

   b. xy = k

   $$y = \frac{k}{x} = \frac{200}{x}$$

   t. $y = \frac{200}{x}$, dabadeed $100 = \frac{200}{x} \Rightarrow x = 2$

   j. $y = \frac{200}{x} \Rightarrow y = \frac{200}{20} \Rightarrow y = 10$

2. b. Saamigal rogaal ah t. saamigal rogaal ah j. Saamigal quman
3. x oo kaliya ayaa ah saamigal rogaal ah
4. maadaama x iyo y isla badalayaan si saamigal rogaal ah.

   b. waxaan haysanaa xy = b madoorsoome

   $\Rightarrow 36 \times 48 = 72 \times b = t \times 16 = j \times 12$

   b = 24, 5 = 108, j = 144

   t. Adigoo isticmaalya farsamo (hab) isku mid ah b = 3, t = 12, j = 9.5

Jawaabaha layliska nakhtiinka ah ee cuttubka 5aad

1. b. {–10} t. 29.2 j. ∅ x. ∅ kh. ma laha xalin d. {2}
2. b. $\left\{\frac{3}{2}\right\}$ t. {2, 1} j. {4,5} x. {2} kh. {22} d. {–2,0}
3. b. $x = y$ iyo $x + 6 = 13$ (Adigoo dhinac kasta ka goynayaa 6)
   t. $2 - x = 1$ iyo $x - 1 = 0$
   j. x – 8 = -2 waxay u dhigantaa x = 6 laakiin x – 8 = -2 uma dhiganto x + 9 = 3
4. maadaama x ~ y, waxay haysanaa $y = kx \Rightarrow 5 = 8k$

   $k = \frac{5}{8}$ (madoorsoomaha saamigalka)

   $\therefore\ y = \frac{5}{8}x \Rightarrow y = 12.5$
5. b. y ~ x, dabadeed y = kx

   $\Rightarrow 14 = k.10 \Rightarrow k = \frac{14}{10} \Rightarrow k = 1.4$

   ∴

x	10	25	35	15	45
y	14	35	49	21	63

   t. maadaama $y \sim \frac{1}{x}$, waxan haysanaa $xy = k \Rightarrow k = 16 \times 16 = 96$

   ∴

x	6	12	15	16	0.75
y	16	8	6.4	6	128

6.

Culeyska (kg)	2	5	t
Qiimaha (Birr)	12	b	36

Maadaama, culeyska muuska iyo qiimihiisu ay isu yihiin saamigal quman, sidaa darteed waxaa isticmaali karnaa xidhiidhka.

$$\frac{x_1}{y_1} = \frac{x_2}{y_2}$$

b. haddaba, $\frac{2}{12} = \frac{5}{b} \Rightarrow b = \frac{12 \times 5}{2} = 30\,\text{birr}$

t. iyo $\frac{2}{12} = \frac{t}{36} \Rightarrow t = \frac{2 \times 36}{12} = \frac{36 \times 2}{12} = 6 \Rightarrow t = 6$

j. Madoorsoomaha saamigalka, $k = \frac{y}{x} = 6$ ama $\left(k = \frac{x}{y} = \frac{1}{6} \right)$

7. b. Xariiqda l_1, ka qado baraha (1, 2), (2, 4) iyo (4, 8) tusaale ahaan, madoorsoomaha saamigalku waa 2.
   t. Xariiqda l_2, ka qaado baraha (1, 1), (2, 2) iyo (4, 4) tusaale ahaan, madoorsoomaha saamgalkuna waa 1.
8. Saamiigalada b, t iyo x waa saamigalo ragaal ah halka j iyo kh ay ka yihiin saamigal quman.

x	1	2	3	4	6	12
y	12	6		3	2	1

CUTTUB 6 JOOMETERIGA IYO CABBIRAADA

HORDHAC

Muhimada ugu weyn ee cuttubkani waa inla ballaadhiyo iyo la sii badiyo aqoonta iyo awooda ay ardaydu u leeyihiin fikradaha asaasiga ah ee joometeriga iyo cabbiraada cuttubku wuxuu u sii qeybsamaa Afar cuttubhoosaad. Cuttub-hoosaad kastaana waxuu u sii qeybsamaa, cinwaano-hoosaado. Cinwaanada lagaga hadli doono cuttubkani waa: xaglaha, dhismaha saddexagalada saddexagalada isu dhigma iyo cabbiraada.

Ujeedooyinka cuttubka:

Marka cuttubku dhammaado dabadeed ardaydu waxay awoodi doonaan inay:

- *caddeeyaan ama kala soocaan xag laha.*
- *caddeeyaan (sababeeyaan) seddexagalada isu-dhigma*
- *dhisaan seddexagalada*

Kaabayaasha loo doorbiday cuttubka 6aad

Buugga ardayga iyo tilmaame baraha, ma'aha ee waliba waxaa kale oo loo baahan yahay oo lagugula talinayaa in aad diyaariso waxaad fasalka u soo qaadataa alaabahan soo socda marka cinwaanka aad dhigayso looga baahado.

Qalabka

Lammaane kombasyo ah, mastarad, xagal-cabbire, qalabka labajibaaranaha, maqasyo iyo sabuurada wax lagu dhajiyo iyo xanjo.

Diyaari shax muujinaysa

- *lammaane xaglo ah oo daris ah*
- *lammaane xaglo daris ah oo ah lammaaneyaal is-dabayaal (xariiqah).*
- *Lammaane xaglo isbuuxsha (180°) iyo xaglo wadartoodu tahay 90°.*
- *Lammaane xaglo foodsaar ah*
- *Xaglaha ka samaysma marka gudbane jaro laba xariiqood*
- *Talaabooyinka la marayo marka la dhisayo seddexagalada ayadoo la isticmaalayo tijaabooyinka SAS, ASA iyo SSS.*
- *Tijaabada isku-dhiganka saddexagalada ayadoo la isticmaalayo SAS, SSS iyo ASA*
- *Isku-bedelka halbeegyada ayadoo mid loo badalayo ku kale.*
- *Wareegyada iyo badadka laydiyada, labajibbaaraneyaasha iyo seddexagalada.*
- *Muggaga shaxanada adkeyaasha.*

6.1 XAGLAHA

Waqtiga loo qoondeeyey: 8 xiisadood

Waxa ardayga laga rabo

Dhammaadka cuttub-hoosaadkan, ardaydu waxay awoodi doonaan inay:

- *caddeeyaan xaglaha dariska ah iyo xaglaha food-saarka*
- *go'aamiyaan xaglaha wadartoodu tahay 90°*
- *go'aamiyaan xaglaha-isubuuxsha*

Ereyo cususb

Xagal, xaglo darisah, xaglo si toosan daris u ah, xaglo foodsaar ah, xaglo wadartoodu tahay 90° xaglo-isbuuxsha, xagal-buuxshe, gudbane, xariiqyo barbaro ah, xaglo-gudeed talantaali ah, xaglo dibadeed talantaali ah, xaglo-isku beegan, xaglo-gudeed iyo xaglo dibadeed.

Qalabka loo baahan yahay

Mastarad, xagal cabire, kombas, maqasyo, moodeel birisam iyo ku-dhululubo

Hordhac

Muhimada cuttub-hoosaadkani waa in ardayda la baro xaglaha in loo kala qeybiyo lammaaneyaal. Cuttub-hoosaadkani wuxuu ka soo farcamey doodeenii ee aan ku soo bilownay fasalka 5^{aad}. Cuttub-hoosaadkan wuxuu u sii qeybsamaa laba cinwaan. Cinwaanka koowaad wuxuu ka hadlaa xaglo lagu caddaynayo lammaaneyaal. Cuttub-hoosaadkan dhexdiisa ardaydu waxay ku baran doonaan xaglaha dariska ah iyo kuwa foodsaarkah, xaglaha dhamaystiran iyo kuwa isbuuxsha, xaglaha isku-lidka ah iyo astaamahooda ciwaanka labaad wuxuu ka hadli wax ku saabsan xaglaha lammaanaha ah.

Cuttub-hoosaadkan dhexdiisa, xaglaha lammaaneyaasha ahi waa kuwa ka samaysma marka gudbane uu jaro laba xariiqood oo barbaro ah. Ardaydu waxay daahfuri doonaan xidhiidhka ka dhexjira xaglaha lammaaneyaasha ah ee ka samaysma gudbanuhu marka uu ka gudbo laba xariiqood oo barbaro ah.

6.1.1 Xaglaha xidhiidhka leh

Gudbinta casharka

Casharka ku bilow adigoo weydiinaya ardayda qeexida xagal, dhinaca xagasha iyo geeska xagasha dabadeedna, ugu celceli sharaxa adigoo qaadanaya layliska nakhtiinka ee 6.1 adigoo ardayda ugu dhigaya hawlgal firfircooni galiya. Markay dhemmeeyaan layliska nakhtiinka ah u qeybi ardayda kooxo yar-yar hana ka doodaan hawlgalka 6.1 waxoogaa daqiiqado ah muddo yar ka dib, weydii inay soo jeediyaan jawaabahooda ay is dheheen waa sax. Adigoo ku salaynaya jawaabaha ardaydu doorteen, sii qeexida xaglaha dariska ah iyo xaglaha foodsaarka ah.

Weydii ardayda xidhiidhka ka dhexeeya xaglaha foodsaarka ah, haddii ay ku adkaato inay ku gabagabeeyaan in xaglaha foodsaarka ahi ay leeyihiin cabbiro isku mid ah, dabadeed tus ardayda sababta ay isugu mid noqdeen dabadeedna ku taageer qeexida xaglaha dariska ah iyo kuwa foodsaarka ah tusaaleyaal gacan ka qabad ah (muuqda).

Marka ardaydu ay kala saaraan xaglaha dariska ah iyo xaglaha foodsaarka ah, dabadeed qeex lammaaneyaasha xaglaha la yidhaa kuwa is-dhemaystira (90°) iyo kuwa isbuuxsha (180°).

Si aad u hubiso fahankooda sii ardayda waxoogaa laylis ah oo ku saabsan xaglaha isdhamaystira iyo kuwa isbuuxsha ugu dambayn waxaad isticmaali kartaa layliska 6.2 shaqo fasal ahaan iyo shaqo guri ahaan waxaad siin kartaa shago kooxeedka 6.1 inay guriga koox ahaan ugaga soo shaqeyaan haddii aad dhammayn kari weydo cuttub hoosaadka xiisad kaliya gudaheed, waxaad ka dhigan kartaa xiisad kale.

Jawaabaha layliska nakhtiinka ee 6.1

1. b. CA iyo CB waa dhinacyada ∠ACB t. C waa geeska ∠ACB
2. b. xagal toosan x. xagal fidsan (daacsan)
   t. xagal quman kh. xagal fiiqan j. xagal noqod
3. b. 140° t. 78° j. 240°
4. b. xagal dhacsan t. xagal fiiqan j. xagal daacsan (fidsan)
   x. xagal fidsan kh. xagal daacsan d. xagal quman
   r. xagal fiiqan
5. Xariiqo barbaro ahi waa xariiqo ku dul-dhaca isku sallax kuwaasoo aan isjarin marka la fidiyo. Xariiqaha marka la dheereeyo bar-iska gooya (wadaaga) waxaa la yidhaa xariiqo is jara.

Jawaabaha Hawlgalka 6.1

1. b. $\overline{BC}$ t. maya j. Haa, waxaa la yidhaa xaglo daris ah
   b. i) $\overrightarrow{AO}$ ii) 180°
   t. i) haa, $\overrightarrow{OB}$ waa dhinaca ay wadaagan ii) 180°
   j. haa x. xaglo foodsaar ah
   kh. haa, lammaanaha ∠AOB iyo ∠COD waxay leeyihiin cabbiro isku mid ah.

Jawaabaha hawlgalka 6.2

1. b. Wadarta xaglo kasta oo lammaane ahi waa 90°
   t. Wadarta xaglo kasta oo lammaane ahi waa 90°
   j. Ardaydu waxay kusiin karaan jawaabo kala duwan. Xaglaha suurto galka ah qaar ka mid ahi waa (2°, 88°), (55°, 37°), (45°, 45°) IWM
   x. haa, xaglo is dhamaystira (90°)
2. b. 30° + 150° = 180°
   1° + 179° = 180°
   60° + 120° = 180°
   90° + 90° = 180°
   t. lammaane kasta, wadarta xagluhu waa 180°
   j. ardayda waxay bixin karaan jawaabo kala duwan, jawaabahan soo socda ayaa suurto-gal ah inay ku siiyaan (44°, 136°), (2°, 178°), (63°, 117°), (110°, 70°)
   x. lammaane kasta oo xaglahan ah waxaa la yidhaa xaglaha isbuuxsha (buuxiye).

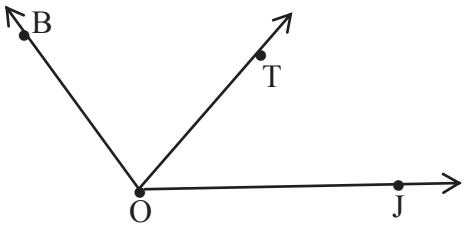
Jawaabaha layliska 6.2

1. ∠AOB iyo ∠BOC iyo ∠AOC iyo COD iyo ∠BOC iyo ∠COD
2. 43°
3. α = 90° - 32° = 58°
   β = 180° - 32° = 148°
4. m (∠LOM) = m (∠PON) = 46
   m (∠MON) = m (∠LOP) = 134°
5.

	α	β
b.	58°	32°
t.	69°	21°
j.	66°	24°
x.	47°	43°

6.

	δ	θ
b.	140°	40°
t.	12°	168°
j.	$24\frac{1}{2}^{o}$	$155\frac{1}{2}^{o}$
x.	25.5°	154.5°

7. i) x ii) kh iii) t iv) j v) b
8. ka soo qaad xagashu inay tahay x, dabadeed xagasha dhemmaystirtaa waa 90° - x.
   Haddaba, $x = 2(90° - x)$
   $x = 180° - 2x$
   $3x = 180° = 60°$
   Sidaas awgeed xagashu waa 60°.
9. Xagasha buuxisa xagal daacsani waa xagal fiiqan
10. 

∠BOJ iyo ∠TOJ waxay wadaagaan dhinaca $\overrightarrow{OJ}$ laakin ma'aha xaglo daris ah.
11. Maadaama θ iyo *r* ay labaduba ka dhigaan β, xagal buuxda, dabadeed θ + β = 180°, taasoo aan, helayno θ + β = *r* + β, haddaan dhinac kasta ka goyno β, waxaan heleynaa θ = δ.

Sidaas darteed, haddii ay laba xaglood u yihin xagal buuxshe, xagal isku mid ah dabadeed labada xaglood waa isku mid.

Jawaabaha shaqo kooxeedka 6.1

1. Ka soo qaad in xagashu tahay x°, dabadeed xagasha dhammaystirtaa waa 90° - x, xagasha buuxisaana waa 180° - x laakiin
   $180° - x = 3(90 - x) + 20$
   $180° - x = 270° - 3x + 20$
   $2x = 290° - 180°$
   $2x = 110 = 55°$
   Haddaba xagashu waa 55°.
   Hubi, in 55° uu yahay dhemaystiraha 35° iyo in xagasha buuxisa 125° ay tahay 55°
   $125° = 3(35°) + 20° = 105° + 20$
   $125° = 125°$

Qiimeyn

Ku bilow qiimeynta ardayda adigaoo ka weydiinaya afka qeexida tobxaha, xagal, geeska xagasha iyo dhinacyada xagasha si aad uga dhaadhiciso ardayda doodaada waxad isticmaali kartaa layliska nakhtiin ka ah ee 6.1 shaqo fasal ahaan maadaama oo su'aalaha intooda badani ay ka dhigan yihiin nakhtiin ahaan u isticmaal wqtiga ugu yar laylisyadan dabadeedna ardayda ka dhig kooxo ka koobu saddex-seeddex, kana dooda hawlgalka 6.1 shan daqiiqo, dabadeed ka jawaaba su'aahaha. Jawaabaha ay ku siiyaan wuxuu kaa caawin doonaa in aad qeexdo xaqlaha deriska ah iyo xaqlaha foodsarka ah dabadeed u gudub hawlqalka 6.2 isticmaal kooxihii aad samaysay hawlgalkii 6.1.

Weydii ardayda jawaabaha adigoo ku salaynaya jawaabahooda, waxaad qeexi kartaa xaglaha isdhamaystira iyo xaglaha isbuuxsha u sii layliska 6.2 shaqo guri ahaan waxaad ugu diri kartaa shaqo kooxeeda 6.1 inay koox ahaan uga soo shaqeyaan.

Waxaad u istixcmaali kartaa kooxihii aad samaysay hawlgalkii 6.1 iyo 6.2 shaqo kooxeedka 6.1 sidoo kale hawlgalkasta, layliskasta iyo shaqo kooxeed kasta hubi ardayda inay fahmeen.

6.1.2 Xaglaha iyo xariiqaha Barbarada ah

Gudbinta casharka

Ku bilow casharka adigoo weydiinaya ardayda su'aalahan soo socda

- *Labada barood ee P iyo Q, imisa xariiqood oo toosan ayaa laga samayn karaa oo mara.*
- *Haddii laba xariiqood oo kala duwan ℓ_1 iyo ℓ_2 ay isjaraan, imisa barood ayay iska jaraa?*
- *Hadii ℓ_1, ℓ_2 iyo ℓ_3 ay ku dul-dhecaan sallax isku midah ayna barbarona ahayn, taasoo ℓ_3 ay jarto ℓ_1, dabadeed ℓ_3 wey jartaa ℓ_2?*

U ogolow ardaydu inay su'aalahan ka doodaan waxoogaa miridho ah dabadeed waxoogaa mirido ah weydii jawaabaha ay u maleeyeen inay sax yihiin, kuna qor sabuurada.

Adigoo ku salaynayaa jawaabaha ardaydu doorbideen, sii jawaabahan soo socda su'aalaha.

- Waxaa jira hal xariiq kaliya oo marta labada barood ee P iyo Q.
- Haddii laba xariiq oo toosani isjaraan, dabadeed waxay iska jaraan hal bar ah.
- Haddi ℓ_1, ℓ_2 iyo ℓ_3 ay ku dul-dhacaan sallax isku mid ah, ayna barbarona ahayn, taasoo ℓ_3 ay jarto ℓ_1, dabadeed l_3 sidoo kale waxay jartaa ℓ_2.

Jawaabta aad siisay su'aasha 3^{aad} waxay

Kaa caawin doontaa inaad siiso qeexida gudbane iyo lammaaneyaasha xaglaha ah ee kala duwan ee ka sameysma gudbanaha marka uu ka gudbo labada xariiqood. Sidaa darteed sii qeexida gudbane iyo lammaaneyasha xaglaha ah ee ka samaysma. Hubi in arday kastaa si cad u fahamay qeexida aad sheegtay (siisay). Xasuusi sidoo kale qeexida xariiqaha barbarada ah dabadeed ardaydu ha ka doodaan hawlgalka 6.3 si ay su'aalaha uga shaqeeyaan ardaydu waa inay fasalka u soo qaataan qalabka labajibbaaranaha, mastarad, iyo xagal cabire su'aalahan waxay ardayda awoodsiin doonaan inay gabagabo muhiim ah ku gabagbeeyaan sidoo kale daba soco caawina si ay u keenaan gabagabada hawlgalka laga filayo miridho ka dib, weydii koox kastaa inay sheegaan jawaabta ay doorbideen inay sax tahay. Adigoo ku salaynaya jawaabaha ardayda, u soo koob ardayda, sheegna gabagabada hawlgalka. Gabagabada aad samaysaa waa gabagabo muhiim ah sidoo kale hubi fahanka ardayda adigoo weydiinaya su'aalo afka ah/oo ku saabsan xaglaha ka samaysma gudbnahu, marka u ka gudbayo xariiqyada barbarada ah haddii aad hubtid in ardaydu u fahmeen qeexida si cad, dabadeed u dir layliska 6.3 shaqo fasal ahaan iyo shaqo guri ahaan ha iloobin in aad shaqada ardayda u hubisid si joogto ah.

Jawaabaha hawlgalka 6.3

1. x. waa isle'eg yihiin
   kh. lammaane xaglo-gudeed talantaali ahi waa isku mid
   d. haa
   r. 180°

2. Markaan eegno x, kh, d iyo r waxaa lagu gabagabayn karaa sidan soo socota. Marka laba xariiqood oo barbaro ah uu ka gudbo gudbane.
   b. xaglo dibadeedka talantaaliga ahi waa isku mid
   t. xaglo dibadeedka talantaaliga ahi waa isku mid
   j. xaglaha isku-beegani waa isku mid
   x. xaglo gudeedka ka samaysma dhinac isku midka ah eee gudbannhu waa xaglo isbuuxsha.

Jawaabaha layliska 6.3

1. b. ∠NMQ iyo ∠TPQ waa xaglo gudboon
   t. Marka $\overleftrightarrow{MN}$ uu barbaro la yahay $\overleftrightarrow{PT}$
2. i) m (∠BEF) = 72° iv) m (∠DGH) = 108°
   ii) m (∠FGD) = 72° v) m (∠CGH) = 72°
   iii) m (AFG) = 72° vi) m (∠FGC) = 108°
3. m (∠ACM) = 45°
4. m (∠D) = 180° - 73° = 107° = m (∠F)
   m (∠G) = 73
5. b. m (∠2) = 50°
   m (∠3) = 130°
   m (∠1) = 130°
   t. m (∠1) = 100°
   m (∠2) = 100°
   m (∠3) = 80°
6. b. Maadaama $\overleftrightarrow{BX} \parallel \overleftrightarrow{TJ}$, dabadeed
   m (∠B) + m (∠T) = 180°
   $\Rightarrow 6x + 3x = 180° \Rightarrow 9x = 180° \Rightarrow x = 20°$
   t. Maadaama $\overleftrightarrow{MN} \parallel \overleftrightarrow{OQ}$, dabadeed
   m (∠MNO) = m (∠QON)
   Hadaba,
   $$150° = 2x$$
   $$\frac{150^o}{2} = x$$
   $$x = 75°$$
7. m (∠2) = 70°

Qiimeyn

Waxaad isticmaali kartaa su'aalaha aan xagga sare ku soo jeedinay inaad afka ka waydiiso. Su'aalahani waxay kaa caawin doonaan inaad qeexdid gudbane iyo inaad ka doodaan astaamaha xaglaha ka samaysma marka gudbanuuhu uu ka gudbo

xariiqyo barbaro ah. Dabadeed ardaydu ha ka doodaan hawlgalka 6.3 kooxo saddex sedex ka kooban hawlgalkani wuxuu ku lug-leeyahay ama uu ka hadlaa cabbiraada xaglaha. Sidaa darteed hubi in ardaydu garteen sida loo cabbiro xaglaha ayagoo isticmaalya xagal cabbire (protractor) hubi sidoo kale in ardaykastaa haysta xagal cabbire dabadeedna sii layliska 6.3 shaqo guri ahaan, hubi in ardaydu laqliska si sax ah ugu shaqeeyeen intaanad u gudbin cuttub-hoosaadka ku xiga.

6.2 DHISMAHA SADDEXAGALADA

Waqtiga loo qoondeeyey: 10 xiisadood

Waxa ugu yaree ardayda laga rabo inay gartaan:

Dhammaadka cuttub-hoosaadkan ardaydu waxay awoodi doonaan inay:

- *dhisaan seddexagal seddexdiisa dhinac lagu siiyey.*
- *dhisaan seddexagal laba-dhinac iyo xagasha u dhaxaysa lagu siiyey.*
- *dhisaan seddexagal laba-xaglood iyo dhinaca u dhexeeya lagu siiyey.*
- *sharaxaan xidhidhka ka dhexeeya dhinacyada iyo xaglaha sadeexagalka.*
- *shararxaan xidhiidhka ka dhexeeya dhinacyada seddexagalka.*

Ereyo cusub

Seddexagal, xariijin, xagal, gacanka goobo gobolka, goobo gobal, xagal u dhexaysa laba dhinac iyo dhinac u dhexeeya laba xaglood.

Hordhac

Cuttub-hoosaadkani wuxuu ka hadlaa dhismaha saddexaglada marka xubnihiisa qaar ka mid ah lagu siiyo wuxuu leeyahay hal cinwaan oo ka hadlaya dhismaha saddexagalada iyo xidhidhka ka dhexeeya dhinaacyada iyo xaglaha seddexagalada. Fasalkii 5^{aad} waxay ku soo qaateen waxoogaa aqoon ah oo ku saabsan waxayaalaha aasaasiga u ah dhismaha. Cuttub-hoosaadkani waa casharadii hore aan u soo aragnay oo la ballaadhiyey.

6.2.1 Dhismaha seddexagalada

B) Dhismaha seddexagalada marka dhererka seddexdiisa dhinac lagu siiyo

Gudbinta casharka

Waxad casharka ku bilaabi kartaa marka ugu horeysa adigoo ardayda xasuusinaya isticmaalka lammaane kombasyo ah iyo mastarad iyo waliba adigoo xasuusinaya waxa uu yahay seddexagal iyo sida loogu bixiyo magac. Intaanad bilaabin dhismaha ka hor, hubi in arday kastaa haysto kombasyo iyo mastarad. Sii muddo ay kaga shaqeeyaan shago kooxeeda 6.1 hana uga shaqeeyaan shaqo kooxeedkan lammaane-lammaane shaqo kooxeedka ka dib, waxaad u sharixi kartaa dhismaha,

hubi in ardaydu si fiican u fahmeen talaabooyinka la marayo marka dhismaha. Markaad dhamayso dhismaha ka dib. Ardaydu ha ka shaqeeyaan layliska 6.4.

Waxaa laga yaabaa in ardayda qaarkood dhibaata kala kulmaan dhismaha, siddas darteed ku wareeg fasalka caawina kuwa u baahan caawimadaada haddii aad hubtid in ardaydu si cad u fahmeen talabooyin la raacayo marka wax la dhisayo, dabadeed waxaad u gubdi kartaa hawlgalka 6.4 hawlgalkani wuxuu kaa caawin doonaa inaad sheegtid kala duwanaanta seddexagalka dabadeedna u sii layliska 6.5 shaqo guri ahaan.

Jawaabaha shaqo kooxeedka 6.1

Shaqo kooxeedkani wuxuu ku jihaysan yahay in ardayda uu ka caawiyo siday u guurin lahaayeen xariijin iyo xagal. Sidoo kale waa inay raacaan talaabooyinka ku qoran dhismaha (1) iyo (2) ee buugga ardayya ayna dhisaan xariijin iyo xagal cabirkeeda lagu siiyey.

Ardayda ka shaqeynaysa shaqo kooxeedka waa inaad u kuur gashaa ku boorisaana (Taageertaa). Ardayda qaarka mid ahi waxay u baahan yihiin taageeradaada.

Jawaabaha hawlgalka 6.4

Seddexlaabiyadu ma raaligalinayaan xaalada dheeliga seddexagalka:

1. j, x, kh, d, r $\Rightarrow$ waa suurtogal in laga samayn karo saddexagalo laakiin b iyo t suurtogal ma'aha waayo waxaa daliil u ah xeerka dheeliga saddexagalada.
2. Wadart labo kamid ah tirooyinka saddex – layda horsan ee b iyo t kama wayno tirade saddexaad, laakiin in takale weey waafaqsanyihiin.
3. b. $b + t > j$
   t. $t + j > t$
   j. $t + j > b$
4. Wadarta dhererka laba dhinac oo kasta waa in uu ka weynaado dhererka dhinaca seddexaad.

Jawaabaha layliska 6.4

1. Layliska 6.4 waxaa loogu talo-galay in uu ardayda ka caawiyo inay si qacan ka qabasho ah u sameeyaan dhismaha 3^{aad} ayagoo isticmaalaya cabbiro qaar ah. Sidoo kale ardaydu ha raacaan talaabooyinka ku qoran dhismaha 3^{aad} hana dhisaan seddexagalada laylisku baahan yahay ayagoo isticmaalaya lammaane kombasyo ah iyo mastarad, wayfiican tahay haddii ardaydu ay ku dul-sawiran warqad cad oo nadiif ah eyna keenaan fasalka waxay sawireen hubi shaqada ardayda, kana dooro ta ugu fiican kuna dheji sabuurada ogeysiis ka lagu dhegiyo ama fasalka dhexdiiisa si ay u dhiiri geliso ardayda.

2. Ayadoo la isticmalayo seddex-seddexda tiro ee lagugu siiyey (b) (j) iyo (kh) waxaad heli kartaa seddexagal, haddaad isticmaasho seddex sedexda tiro ee lagugu siiyey (t) iyo (x) na heli maysid seddexagal, haddaad isticmaasho seddex-seddexda tiro ee lagugu siiyey (t) iyo (x) na hali maysid seddexagal.
3. b. 7 sm
   t. 2 sm
   j. 4,5 sm

Qiimeyn

Waxaad ku fahmi kartaa ardayda inay fahmeen cinwaan hoosaadkan adigoo isticmaala shago kooxeedka 6.2, layliska 6.4, hawlgalka 6.4 iyo layliska 6.4, layliska 6.5 waxaad u siin kartaa shaqo guri ahaan.

T) Dhismaha 4^{aad}

Gudbinta casharka

Casharka waxaad ku bilaabi kartaa adigoo ugu calinaya (Nakhtiin) talaabooyinka loo baahan yahay si loo sameeyo (dhiso) seddexagal marka lagu siiyo dhererka seddexdiisa dhinac dabadeed u soo koob talaabooyinka loo baahan yahay si loo sameeyo (sawiro) seddexagal marka laba dhinac iyo xagasha u dhaxaysa la haysto ama lagu siiyo.

Ayagoo raacaya talaabooyinkan ardaydu ha sawiraan (sameeyaan) iyaga laftoodu. Ardayda qaarkood waxaa laga yaabaa inay ku adkaat dhismaha seddexagalku sidaa darteed ku wareeg ardayda, caawina hubi ardayda shaqadooda, dhiiri galina ardayda sawirka saxda ah sameeyay. Dhimaha ka dib ardaydu gacantooda ha ka qabtaan dhismaha 4, aad adigoo uga gudbaya layliska 6.6 shaqo fasal ahaan iyo shaqo guri ahaanba. Ardaydu waxay uga shaqeyn karaan layliska 6.6 koox-koox ahaan ama mid-midba.

Jawaabaha layliska 6.5

Ujeedada layliskani waa in uu ardayda ka caawiyo sidii ay si gacan ka qabasho ah u mari lahaayeen talaabooyinka la raacayo marka la sameynayo seddexagal lagu siiyey labadiisa dhinac iyo xagasha u dhaxaysa. Sidoo kale ardaydu ha raacaan talaabooyinka dhismaha 4^{aad}, hana sawiraan seddexagalada hubi in arday kastaa si sax ah u sawiri (sameyu) karo seddexagalada asagoo isticmaalaya lammaane kombasyo ah iyo mastarad u sax shaqadooda, doorona midka ugu shaqo fican, kuna dheji sabuurada Agteeda.

Qiimeyn

U sii layliska 6.6 shago fasal ahaan iyo shago guri ahaan, hubina shaqadooda.

J) Dhismaha 5aad

Gudbinta cahsarka

Dhismahan ardaydu waxay ku baran doonaan sida loo dhiso seddexagal marka la haysto laba xaglood iyo dhinaca u dhexeeya. Siddo kale marka u horeysa u soo koob talaabooyinkii la qaaday dhismaha 1aad mid-mid dabadeed ardaydu ha dhisaan (sameeyaan) seddexagalka. Ayagoo raacaya talaabooyinka ugu qoran iskood. Markay ardaydu sameynayaan dhismaha ku wareeg fasalka, hubina shaqada ardayda adigoo ka caawinaya waxay u baahan yihiin, dhiirigali ardayda dhismaha u samaysay si sax ah. Haddii aad hubtid in ardaydu ay si sax ah u sameeyeen dhismaha, dabadeed sii qaar ka mid ah su'aalaha layliska 6.7 shaqo fasal ahaan inta hadhayna u sii shaqo guri ahaan u sheeg ardayda inay shaqada u qabtaa si nadiif ah.

Jawaabaja layliska 6.8

Layliska 6.7 waxaa loogu talo galay in uu ardayda ka caawiyo inay si gacan ka qabasho ah u sameeyaan, dhismaha 5aad, ardayda u sheeg inay raacaan talaabooyinka dhismayaasha ayna ka shaqeeyaan laylisyada.

Qiimeyn

U isticmaal laylisak a 6.7 shaqo fasal iyo shaqo guri.

X) Xidhiidhka ka dhaxeeya dhinacyada iyo xaglaha seddexagalka

Gudbinta casharka

Waxaad ku bilaabi kartaa casharka adigoo u nakhtiimaya kala soocida seddexagalada ayadaoo lagu salaynaayo dhererka dhinacyadooda iyo cabbirka xaglahooda, kaasoo ay ku soo barteen fasalkii 5aad dabadeedna u isticmaal hawlgalka 6.5 si uu u noqdo hawlgal dardar galiya ardayda ha u qabtaan koox-koox hawlgalka ujeedada hawlgalkani waa in ardayda laqu hogaamiyo sidii ay iskood ugu gabagabyn lahaayeen xidhiidhka ka dhex jira dhinacyada seddexagalada iyo xaglaha haddii aad hubto in ay ardaydu si fiican uga shaqeeyeen hawlgalka dabadeed sheeg gabagabada hawlgalka, taasoo uu sheegayo buugga ardaygu, ku taageer gabagabadan adigoo isticmaalaya tusaaleyaal gaar ah dabadeed u sii layliska 6.8 shaqo guri ahaan.

Jawaabaha hawlgalaka 6.5

2. Seddexagal, ka labaalaha ah xaglaha ka soo horjeeda dhinacyada isle'egi wey isle'eg yihiin. Seddexagalka simana seddexdiisa xaglood dhammaan cabbirkoodu waa isku mid taas oo xagal kasta oo seddexaglka siman xaglihiisa ka mid ah cabbirkeedu waa 60°,
4. b. haa t. haa j. haa x. haa
5. seddexda xaglood ee seddexagalka siman cabbirkoodu waa isku mid. Taas oo cabbirka xagal kasta oo seddexagalka siman cabbirkeedu yahay 60°.
6. Maya

Jawaabaha layliska 6.8

1. $\overline{BJ}$
2. Maya, waayo tirooyinku ma-raali galinayaan xaalada dheeliga seddexagalka.
3. Haa, m (∠R) = 180° - (30° + 30°) = 120°

Qiimeyn

Waxaad ku qiimeyn kartaa ardayda in aad u dirto hawlgalka 6.5 iyo layliska 6.8 shaqo fasal ahaan iyo shaqo guri ahaanba. Waxaa kale oo aad isticmaali kartaa tusaaleyaasha ku yaala buugga ardayga adigoo afka ka weydiinaya.

6.3 SADDEXAGALO ISU-SARGO'AN

Waqtiga looqoondeeyey: 12 xiisadood

Waxa ardaydo laga rabo

Dhammaadka cuttub-hoosaadkan ardaydu waxay awoodi doonaan inay:

- *Sharaxaan fikradaha isu-sargo'naanta seddexagalada*
- *Hubiyaan isu-sargo'naanta seddexagalo lagu siiyey adigoo isticmaalaya baadhitaan sawirid, goynaya iyo adigoo is-dulsaaraya.*
- *Caddeeyaan isku-sargo'naanta laba seddexagal oo lagu siiyey adigoo isticmaalaya dhardhaarada isku-sargo'naanta (tests) SAS, SSS iyo ASA.*

Ereyo cusub

Isu-sargo'an, Dhinacyada isu-beegan, Xaglaha isu-beegan, Seddexagalo isu-sargo'an

Dhardhaarada SSS ee isu-sargo'naanta,

Dhardhaarka SAS ee isu-sargo'naauta,

Dhardhaarka AAS ee isu-sargo'naanta.

Hordhac

Muhimada ugu weyn ee cuttub-hoosaadkani waa in ardayda la baro isku-sargo'naanta seddexagalada iyo dhardhaarada isku-sargo'naanta cuttub-hoosaadkani wuxuu u sii qeybasamaa laba cinwaan-hoosaad. Cinwaan-hoosaadka koowaad ardaydu waxay ku baran doonaan qeexida dhabta ah ee isku-sargo'naanta cinwaan-hoosaadka labaad waxaa lala qabaadsiin doonaa dhodhaarada isu-sargo'naanta. Waxay ku baran doonaan seddex dhardhaar oo muhiim ah oo isku-sargo'naanta ah.

Waxaana la kala dhahaa: Dhardhaarka SSS,dhardhaarka SAS iyo Dhardhaarka AAS.

6.3.1 Isku-sargo'naanta seddexaglada

Gudbinta casharka

Nidaamka iyo calaamadaha isku-sargo'naanta waa midka mid ah waxayaalaha ugu muhiimsan barashada joometeriga. Sidaa darteed waa, inaad siisaa waqti aad kaga dhaadhiciso, kuna barto ardayda fikradaha cuusub waa inaad isticmaasho hababa kala duwan si ay ardaydu si dhibyar fahmaan (ururSadaan) fikradahan. Waxaa kale oo aad isticmaali kortaa sawiro kala duwan oo aad ka samaysay warqado aad goysay si uu kaaga caawiyo casharka waxad ku bilaabi kartaa hawlgalka 6.6 si aad ardaydu u firfircooni galiso.

Ujeedada hawlgalkani waa sidii ardayda looga caawin lahaa inay fahmaan in laba sawir oo joometeri ay isku-sargo'naan doonaan haddii labada sawir ee joomatari ay leeyihiin qaab iyo xajmi isku mid ah.

Hawlgalka ka dib waxaad siin kartaa qeexida loogu talogalay ee isku-sargo'naan ee ku qoran buugga ardayga hubi in ardaydu fahmeen qeexida, ku taageer qeexida adigoo siinaya tusaaleyaal ku filan. Isla-markaana bar ardayda summadaha loo isticmaalo isku-sargo'naanta seddexagalada dabadeed ha ka shaqeeyaan shaqo kooxeedka 6.3 kooxo-seddex-seddex ah hana tijaabiyaan isu-sargo'naanta seddexagalada ayagoo isticmaalaya warqad ay qooyaan.

Jawaabaha hawlgalak 6.6

Ogow in su'aalaha lagugu siiyey hawlgalka 6.6 intooda badani ay yihiin tijaabo. Sidaa dardeed ardaydaada ku dhiirigali inay isku-tijaabiyaan hawlgalka.

1. b. maadaama oo aanay labada sawir lahayn qaab isku mid ah, dabadeed ma'aha isku qaab.
   t. maya
2. b. haa
   t. maya, waayo waxay leeyiliin dhinacyo kala duwan.
   j. maya, waayo waxay leeyihiin dherer iyo ballac kala duwan.

3. b. maya t. maya
4. b. haa t. maya
5. b. haa t. haa
   j. haa, marka xaglaha ku calaamadsan xarfuhu ay isku mid yihiin.

Jawaabaha shaqo kooxeedka 6.3

1. Inta jeer ee seddexagal la dhisaa waxa laga yaabaa in ay isku-sargo'an tahay isaga laftiisu ayadoo ku xidhan nooca seddexagalka, haddii uu yahay seddexagal aan isle'ekayn oo seddexdiisa dhinac kala duwan yihiin, waxaa jira uun hal jid oo kaliya, hadduu yahay labaale waxaa jira laba jid, haddii uu yahay mid seddexdiisa dhinac isle'eg yihiin waxaa jira lix jid.
2. Waxaa jira lix jid oo kale duwan.

Qiimeyn

Ardayda waxaad ku qiimeyn kartaa adigoo weydiiya su'aalo afka ah ayna ka shaqeeyaan masalooyinka lagugu siiyey tusaale ahaan buugga ardayga shaqo fasal ahaan waxa kale oo aad u habayn su'aalo aad adigu samayso inay guriga kaga soo shaqeeyaan.

3-da dhardaar ee isu-sargo'naanta seddexagalada

Waxaad ku bilaabi kartaa cinwaan hoosaadkan adigoo xasuusinaya ardayda qeexida isu-sargo'naanta seddexaglada iyo summadaha loo isticmaalo sargo'nida. Dabadeed bar seddexda dhardhaar ee loo isticmaalo si loo caddeeyo sargo'naanta seddexagalada.

B. Dhardhaarka Dhinac-xagal-dhinac (SAS)

Qaybtan waxaad ku bilaabi kartaa adigoo qaadanaya hawlgalka 6.7 waxaa la rajeynayaa in ardaydu ay aakhirka Imaan doonaan maxsuulka dhadhaarkan ayagoo samaynaya tijaabo. Sidaas awgeed ka dhig ardayda koox-koox, seddex-seddex ah, hana ka doodaan su'aalaha lagugu siiyey hawlgalka. Ardaydu waxay u baahan yihiin inay haystaan qalabka xisaabta ardaydu ha soo jeediyaan jawaabaha ay doorbideen inay sax yihiin adigoo ku salaynaya jawaabaha ardaydu bixiyeen. Sheeg dhardhaarka isu-sargo'naanto seddexagalada ee SAS. Hubi in ardaydu si cad u fahmeen dhardhaarkan ku taageer dhardhaarkan SAS tusaaleyaal ku filan dabadeedna isticmaal layliska 6.9 shaqo fasal ahaan iyo shaqo guri ahaanba.

Jawaabaha hawlgalka 6.6

1. d. BJ = DKH = 5 sm r. haa s. haa
2. haa, haa

Jawaabaha layliska 6.6

1. b. $\angle B \equiv DKH = 5$ sm r. $\overline{RS} \equiv \overline{NQ}$ s. $\angle Q \equiv \angle X$

2. 1. $\overline{BJ} \equiv \overline{TJ}$ waa lagu siiyey
   2. $\angle BJX \equiv \angle TJX$ siin
   3. $\overline{JX} \equiv \overline{JX}$ dhinaca ay wadaagaan labada seddexagal
   4. Sidaas darteed, $\Delta BJX \equiv \Delta TJX$ marka loo eego dhardhaarka SAS iyo talaabooyinka 1, Q iyo 3.

3. Seddexagalada, ΔAEB iyo ΔDEC

   Siin, $\overline{AE} \equiv \overline{DE}$ iyo $\overline{BE} \equiv \overline{CE}$

   si loo caddeeyo: in $\Delta AEB \equiv \Delta DEC$

   Falanqeyn

   1. $\overline{AE} \equiv \overline{DE}$ siin
   2. $\angle AEB \equiv \angle DEC$ xaglo foodsaar ah
   3. $\overline{BE} \equiv \overline{CE}$ siin
   4. $\Delta AEB \equiv \Delta DEC$ talaabooyinka 1, 2, 3 iyo dhardhaarka SAS.

4. Seddexagalada: ΔBTX iyo ΔJTX

   Siin: $\overline{BT} \equiv \overline{JX}$ iyo $\angle BTX \equiv \angle JTX$

   Si loo caddeeyo: in $\Delta BTX \equiv \Delta JTX$

   Falanqeyn (Dood):

   1. $\overline{BT} \equiv \overline{JT}$ siin
   2. $\angle BTX \equiv \angle JTX$ siin
   3. $\overline{TX}$ waa dhinac ay wadaagaan
   4. Sidaas darteed, $\Delta BTX \equiv \Delta JTX$ talaabooyinka 1, 2, 3 iyo dhardhaarka SAS.

5. Seddexagalada: ΔABE iyo ΔCFD

   Siin: 1. $\overline{AB} \equiv \overline{CD}$
   2. $\overline{BE} \equiv \overline{DF}$
   3. $\angle ABE \equiv \angle CDF$

   Si loo caddeeyo: in $\Delta AEB \equiv \Delta CFD$

   Faallo:

   1. $\overline{AB} \equiv \overline{CD}$ siin
   2. $\angle ABE \equiv \angle CDF$ siin
   3. $\overline{BE} \equiv \overline{DF}$ siin
   4. Sidaas darteed, $\Delta ABE \equiv \Delta CDE$ talaabooyinka 1, 2, 3 iyo dhardhaarka SAS.
   5. Hadaba, $\angle AEB \equiv \angle CED$

6. $\angle ABC \equiv \angle DEF$
7. $\overline{PR} \equiv \overline{US}$

T) Dhardhaarka dhinac dhinac-dhinac ee isu-sarqo'naanta seddexagalada

Gudbinta casharaka

Ku bilow cinwaan-hoosaadka, adigoo ugu celinaya dhardhaarka SAS ee sargo'naanta seddexagalada dabadeed weydii ardayda su'aalahan soo socda "miyey jiraan dhardhaaro kale oo aan ahayn SAS, oo loo isticmaalo in lagu caddeeyo isu-sargo'naanta seddexagalada"? u agolow ardayda inay ka fikiraan inuu jiro dhardhaar kale.

Habee jawaabaha ardayda, kuna hogaami ardayda shaqo kooxeedka 6.4 ha kaga shaqeeyaan shaqo kooxeedka kooxo seddex seddex ah, hana helaan jawaabaha. Adigoo ku salaynaya jawaabahooda. Ardayda sheeg dhardhaarka SSS ee isu-sargo'naanta saddexaqalada ku kab (caawi) dhardhaarkan tusaalayaal dabadeed, u sii layliska 6.10 shaqo fasal ahaan iyo shaqo guri ahaanba.

Jawaabaha shaqo kooxeedka 6.4

Ujeedada shaqo kooxeedkani waa in ardayda lagu dhiirigaliyo inay dhardhaarkan SSS ku soo gabagabeeyaan tijaabin cinwaan-hoosaadki 6.2 waxay ku soo barteen sida loo dhiso seddexagalada marka la haysto seddexda dhinac ayadoo la isticmaalayo lammane kombasyo ah iyo mastarad. Ayadoo tan loo eegayo, wey ka jawaabi karaan su'aalaha ayadoo lagu salaynayo dhismaha ay dhiseen.

3. Haa
4. Haa, $\Delta ABC \equiv \Delta DEF$: maadaa $\overline{AB} \equiv \overline{DE}, \overline{BC} \equiv \overline{EF}, \overline{CA} \equiv \overline{FD}, \angle A \equiv \angle D, \angle E$ iyo $\angle C \equiv \angle F$

Jawaabaha layliska 6.7

1. Seddexagalada ABC iyo ACD
2. $\overline{AB} \equiv \overline{AC}$ iyo $\overline{DB} \equiv \overline{DC}$

   ii) m ($\angle BDA$) = 30°
   si loo helo m ($\angle BEC$)

Falanqeyn

1. $\overline{AB} \equiv \overline{AC}$ siin
2. $\overline{BD} \equiv \overline{CD}$ siin
3. $\overline{AD}$ waa dhinaca ay wadaagaan

4. $\Delta ABD \equiv \Delta ACD$ talaabooyinka 1, 2, 3 iyo SSS
5. Hadaba, $\angle BDA \equiv \angle CDA$ talaabada 4^{aad} iyo qeexida isku-sargo'naanta.
6. Laakiin m ($\angle BDA$) = 30° siin
7. Hadaba m ($\angle CDA$) = 30°

2) Saddexagalada ΔBDE iyo ΔCEB

i) $\overline{BD} \equiv \overline{CE}$

ii) $\overline{DC} \equiv \overline{EB}$

iii) m ($\angle BDE$) = 50°

si loo raadiyo m ($\angle BEC$)

Falanqeyn

1. $\overline{BD} \equiv \overline{CE}$ siin
2. $\overline{DC} \equiv EB$ siin
3. $\overline{BC} \equiv CB$ dhinac ay wadaagaan
4. Hadaba, $\Delta BDC \equiv \Delta CEB$ talaabooyinka 1, 2, 3 iyo SSS
5. $\angle BDC \equiv \angle CEB$ talaabada 4 iyo qexida isu-sargo'naanta seddexagalada.
6. Laakiin m ($\angle BDC$) = 50°
7. Dabadeed m ($\angle CEB$) = 50° qeexida isu-sargo'naanta xaglaha iyo talaabada (5).
8. Sidaas darteed, m ($\angle BEC$) = 50°

3) Seddexagalada ΔABD iyo ΔACD

1. $\overline{AB} \equiv \overline{AC}$
2. $\overline{BD} \equiv \overline{CD}$

Si loo caddeeyo: $\angle ADB \equiv \angle ADC$

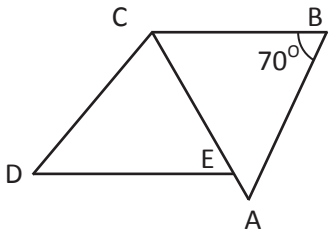
Falangeyn:

1. $\overline{AB} \equiv \overline{AC}$ siin
2. $\overline{BD} \equiv \overline{CD}$ siin
3. $\overline{AD}$ waa dhinaca ay wadaagaan
4. Hadaba, $\Delta ABD \equiv \Delta ACD$ talaabooyinka 1, 2, 3 iyo SSS
5. Sidaas awgeed $\angle ADB \equiv \angle ADB$ talaabada 4^{aad} iyo qeexida isu-sargo'naanta seddexagalada.

4) Seddexagalada, ΔABC iyo ΔDCE

1. $\overline{AB} \equiv \overline{CD}$
2. $\overline{AC} \equiv \overline{ED}$
3. $\overline{BC} \equiv \overline{CE}$
4. m ($\angle CBA$) = 70°

Si loo raadiyo m ($\angle D$)



Fallanqeyn

1. $\overline{AB} \equiv \overline{DC}$ siin
2. $\overline{AC} \equiv \overline{DE}$ siin
3. $\overline{BC} \equiv \overline{CE}$ siin
4. Sidaa awgeed $\Delta ABC \equiv \Delta DCE$ talaabooyinka 1, 2, 3 iyo SSS
5. Sidaa awgeed, $\angle BAC \equiv \angle CDE$
6. Laakiin m ($\angle BAC$) = 70° siin
7. Sidaa awgeed m ($\angle CDE$) = 70° talaabooyinka 5, 6 iyo qeexida isu-sargo'naanta seddexagalada.
8. Sidaas darteed, m ($\angle D$) = 70°

5) Seddexagalaada, ΔABD iyo ΔDCA

1. $\overline{AB} \equiv \overline{DE}$
2. $\overline{BC} \equiv \overline{EF}$

Si loo caddeeyo
$\Delta ABD \equiv \Delta DCA$

Fallanqeyn (faalo)

1. $\overline{AB} \equiv \overline{DE}$ siin
2. $\overline{BC} \equiv \overline{CA}$ siin
3. $\overline{AD} \equiv \overline{DA}$ xariiqa laftiisa ayaa isu-sargo'an
4. $\Delta ABD \equiv \Delta DCA$ talaabooyinka 1, 2, 3 iyo SSS.

6) ΔABC ≡ ΔDEF . . . SSS

Laakiin ΔABC waa seddexagal xagal fiiqan leh sidoo kale ΔDEF waa seddexagal xagal fiiqan leh.

7. $\overline{BC} \equiv \overline{AD}$

J) Dhardhaarka xagal-dhinac-xagal ee isu-sargo'naanta seddexagalada (ASA)

Gudbinta Casharka

Waxaad ku bilowdaa casharka adigoo u nakhtiimaya dhardhaarada SAS iyo SSS ee isu-sargo'naanta seddexagalada, weydiina ardayda su'aasha "miyey jirtaa Dhardhaar kale oo ka duwan SAS iyo SSS taas loo isticmaalo isu-sargo'naanta seddexagalada" u tilmaan hadday jirto tu kale, habee jawaabahooda, sheeg qeexida 6.9, kuna taageer qeexida tusaalaha 7^{aad}.

Markaad sheegtid qeexida 6.9 dabadeed isticmaal hawlgalka 6.8 si aad ugu dardargaliso ardayda in aad u hogaamiso Dhardhaarka seddexaad ee sargo'naanta ka samee ardayda kooxo ka kooban sedex seddex, hana ka doodaan hawlgalka 6.8 adigoo ku salaynaya jawaabaha ardayda sheeg dhardhaarka xagal-dhinac-xagal ee sargo'naanta seddexagalada ku taageer Dhardhaarka xagal dhinac xagal tusaaleyal gaar ah ugu dambaynta isticmaal Layliska 6.11 shaqo fasal ahaan iyo shaqo guri ahaan.

Qiimeyn

Waxaad qiimeyn kartaa ardayda adigoo weydiinaya su'aalo afka ah ku soo jiido in ay ka shaqeyaan hawlgalka 6.8 iyo layliska 6.11 shaqo fasal ahaan iyo shaqo guri ahaanba.

Jawaabaha hawlgalka 6.8

2. Kh. haa d. haa r. haa
3. haa, waayo, dhinacyada isu-beegani iyo xaglaha ΔABC iyo ΔDEF wey isu-sargo'an yihiin

Jawaabaha layliska 6.8

1. ΔCAB iyo ΔDEF
   1. m (∠E) = m (∠A) = 30°
   2. AB = EF = 3s m
   3. m (∠F) = m (∠B) = 70°
      si loo caddeeyo in ΔCAB ≡ ΔDEF
   1. m (∠E) = m (∠A) siin
   2. ∠E = ∠A talaabada 1^{aad} iyo qeexida sargo'naanta xaglaha.
   3. $\overline{EF} = \overline{AB}$ siin
   4. $\overline{EF} \equiv \overline{AB}$ talaabada 3 iyo qeexida isu sargo'naanta xariijimaha.
   5. m (∠F) = m (∠B) siin
   6. ∠F ≡ ∠B talaabooyinka iyo qeexida isu-sargo'naanta xaglaha.
   7. ΔDEF ≡ ΔCAB talaabooyinka 2, 4, 6 iyo
      Dhardhaaka ASA ee isu-sargo'naanta seddexagalada.

2) Siin

   1. ∠BAC ≡ ∠DEC
   2. $\overline{AC} \equiv \overline{EC}$

   Si loo caddeeyo in ΔABC ≡ ΔEDC

Fallanqeyn

1. ∠BAC ≡ ∠DEC siin
2. $\overline{AC} \equiv \overline{EC}$ siin

3. $\angle ACB \equiv \angle ECD$ xaglo foodsaar ah
4. $\Delta ABC \equiv \Delta EDC$ talaabooyinka 1, 2, 3 iyo Dhardhaarka ASA ee isu-sargo'naanta seddexagalada.

5) $\angle B \equiv \angle D$

6) $\overline{HE} \equiv \overline{LM}$

7) $\Delta ABC \equiv \Delta MLN$ . . . ASA

Hadaba, $\overline{AC} \equiv \overline{MN}$

Sidaas darteed, MN = 35 m

6.4 CABBIRAADA

Waqtiga loo qoondeeyey: 12 xiisadood

Waxa laga rabo ardayga

Dhammaadka cuttub-hoosaadka ardaydu waxay awoodi doonaan in ay:

- *ka soo dhiraandhiriyaa qaaciidada bedka seddexaglaka quman, bedka laydiga*
- *ka shaqeeyaan bedka seddexagalka quman*
- *u bedelaan sentimitir labbajibaaran, mitir labajibbaaran iyo kasoo horjedka*
- *ka shaqeeyaan wareega seddexagalada*
- *daahfuraan qaacidada mugga birisam laydiyeedka*
- *u bedelaan sentimitir seddexjibbaaran litir iyo mitir seddexjibbaaran iyo ka soo horjeedka.*

Ereyo cusub

Laydi, seddexagal, seddexagal quman, Bed, wareeg, helbeeg labbajibaarn, mitir labajibbaaran, sentimitir labajibbaaran, hektar, Birisam laydiyeed, mug halbeeg seddexjibaaran, mitir seddexjibaaran, sentimitir seddexjibaaran, litir iyo miliilitir.

Hordhac

Cinwaan-hoosaadkan ardaydu waxay la qabsan doonaan sawirada (shaxanada) sallaxyada sida (shaxanada) sida laydiyada iyo seddexagalada iyo cabbirka wareegyadooda iyo Bededkooda. Waxay isku bedeli doonaan halbeegyada bededka ayagoo mid u bedelaya halbeeg kale waxa kale oo ay soo saari doonaan muggaga Birisamyada iyo waliba waxay isu bedeli doonaan halbeeg yada mugga ayagoo mid u bedalaya ku kale. Cuttub-hoosaadku wuxuu u sii qeybsamaa laba cinwaan-hoosaad ka koowaad wuxuu ka hadlaa bedka seddexagalka quman iyo wareega seddexagalada ka labaadna wuxuu ka hadlaa mugga Birisam laydiyeed.

6.4.1 Bededka seddexagalada quman iyo wareega seddexagalada

Gudbin casharka

Ku bilow cinwaan-hoosaadkan adigoo u nakhtiimaya noocyada kala duwan ee seddexagalada ayadoo xooga aad saarayso seddexagalka quman seddexdiisa dhinac waxay leeyihiin magac gaar ah labada dhinac ee gaaban waxaa la yidhaa lugaha, dhinaca ugu dheerna waxaa la yidhaa shakaal. Xasuusi ardayda qaaciidada wareega iyo bedka ee laydiga kaasoo ay ku soo dhigteen fasalka 5^{aad}.

Dabadeed isticmaal hawlgalka 6.9 adigoo ardayda ku firfircooni galinaya u qeybi ardayda kooxo ka kooban seddex seddex hana ka doodaan hawlgal waxoogaa miridho ah. Adigo ku salaynaya jawaabaha ardaydu bixiyaan u nakhtiin qaacidada bedka laydiga barna xariiqda isu-xidha laba gees oo kasta oo iska soo horjeeda ee laydiga ama (xagal-gooye) dabadeed ardaydu ha ka shaqeeyaan hawlgalka 6.10 ujeedada hawlgalkani waa in ardayda laga caawiyo siday u daahfuri lahaayeen qaaciidada bedka sedeexaglaka quman, ta bedka laydiga.

Adigoo ku salaynaya jawaabaha ardayda barqaaciidada bedka seddexdagalka quman kuna taageer qaaciidada tusaaleyaal u isticmaal jaaniskan si aad ardayda u tustid sida loogu bedelo helbeegyada bedka halbeeg kale oo bedku leeyahay dabadeed ardaydu ha ka shaqeeyaan layliska 6.12 shaqo fasal ahaan iyo shaqo guri ahaan. Marka ay layliska dhameeyaan ka dib xasuusi ardayda waxa uu yahay wareega shaxan sallax ahi, dabadeedna sheeg qaaciidada wareega seddexagalka ku taageer qaaciidada tusaaleyaal dabadeed ardaydu ha ka shaqeeyaan layliska 6.13 shaqo fasal ahaan ama shaqo guri ahaan.

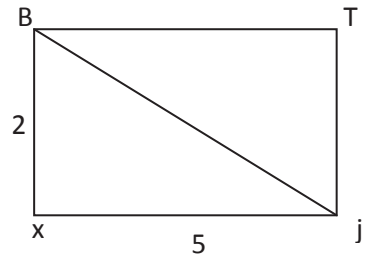
Jawaabaha hawlgalka 6.9

1. b. laydigu waa afar-dhinacle leh 4-dhinac oo labada iska soo horjeedaaba ay isu-sargo'an yihiin, oo dhamaana afartiisa xaqlood ay yihiin xaglo quman.
   t. 90°
2. b. 12 sentimitir oo labajibbaaran t. Badka laydiga
3. b. (dh × b) oo halbeeg labajibaaran t. beedka laydiga

Jawaabaha hawlgalka 6.10

1. b. 2 sm × 5 sm = 10 sentimitir labajibbaaran.

x.



Maadaama $\overline{BX} \equiv \overline{TJ}, \angle X \equiv \angle T$ iyo $\overline{XJ} \equiv \overline{TB}$ dabadeed $\Delta BXJ \equiv \Delta JTB$ SAS

Kh. Maadaama $\Delta BXJ \equiv \Delta JTB$ dabadeed bedka ΔJTB

d. $a(\square BTJX) = a(\Delta BXJ) + a(\Delta JTB)$

$= 2a(\Delta BXJ)$

Sidaas dardeed, badka ΔBXJ $\Delta BXJ = \frac{1}{2}$ bedka $\square BTJX$

2. t. Bedka (ΔMOP) = Badhka Bedka $\square$ BTJX j. haa

Jawaabaha laylisak 6.9

1. 24 sm labajibbaaran

2. $A = \frac{1}{2}bt$

$24 = \frac{1}{2} \times 8 \times t \Rightarrow 24 = 4t$

$JA = \frac{24}{4} = 6$ sm

3.

b	t	A
3	4	6
6	8	24
18	24	216

A = Bedka

4. Bedka shaxaanku = Bedka seddexagalka + Bedka laydiga

$\frac{1}{2} \times 5 \times 12 + 6 \times 12 = 30 + 78 = 108$ halbeeg labajibbaaran

5. b. 5 mitir labajibbaaran t. 0.1 mitir labajibaaran
   j. 60,000 mitir labajibaaran

6. b. 80,000 sentimitir labajibbaaran
   t. 6000 sentimitir labajibbaaran
   j. 5,000,000,000 sentimitir labajibaaran

7. b. 6 hektar t. 4 hektar j. 0.012 haktar

8. Bedka gobolka hadhaysani = Bedka laydiga – Bedka seddexagalka

$= 5 \times 24 - 2\left(\frac{1}{2} \times 3 \times 4\right) = 120 - 12 = 108$ sentimitir labajibbaaran

9. b. 8 + 11 + 13 = 32 sm t. 21 + 11 + 25 = 57 sm
   j. 9 + 12 + 15 = 36 sm
10. 7 sm
11. b. 24 sm t. 24 sentimitir labajibbaaran
12. Wareega gobolka hadhaysani = wareega laydiga + 2 (3 + 4)
    = 2 (5 + 4) + 2 (7) = 10 + 14 = 32 sentimitr

Qiimeyn

Waxaad ku qiimeyn kartaa ardayda adigoo weydiiya su'aalo afka ah oo cinwaan hoosaadka la xidhiidha isticmaal hawlgalada 6.9 iyo 6.10 si aad ugu qiimeyso fahamka ardayda u sii layliska 6.12 iyo 6.13 shago fasal ahaan iyo shago guri ahaan ha ilaawin in aad u hubiso shaqadooda si joogta ah, aanad siisid jawaab celin. Dhiirigeli ardayda laylisyada si sax ah uga soo shaqeeyey.

6.4.2 Mugga Birisam laydiyeedka

Gudbinta casharka

Waxaad ku bilaabi kartaa cinwaan-hoosaadkan adigoo u dul-maraya qaaciidooyinkii laga soo. Dhiraan-dhiriyey muggaga Birisamyada iyo seddexjibaarane-yaasha ee fasalkii 5^{aad} si aad u xoojiso doodan waxaad isticmaali kartaa hawlgalka 6.11 shaqo kooxeed ahaan u agolow ardaydu inay ka doodaan hawlgalka 6.11 waxooga miridho ah. Adigoo ku salaynaya jawaabahooda. Waxaad sheegi kartaa qaaciidada mugga birisamyada ku taageer qaaciidada mugga tusaaleyaal dabadeedna ka dooda sida halbeega mugga loogu bedeli karo mid kale waa inaad ku xoojisaa doodan tusaaleyaal iyo laylisyo aad u hubi in ardaydu fahmeen sida halbeegyada mugga loogu bedelo mid, midkale, waxaad ku tijaabin kartaa fahamka ardayda layliska 6.14. Su'aalaha qaarkood shaqo fasal ahaan u sii inta hadhayna shaqo-guri ahaan u sii.

Jawaabaha hawlgalka 6.10

1. b. $3 \times 4 \times 8 = 96$ sentimitir seddexjibaaran
   t. $3 \times 4 \times 5 = 60$ senitmitir seddexjibbarah
2. dh × b × J halbeeg seddexjibbaaran
   dh = dherer
   b = ballac
   J = joog

Jawaabaha layliska 6.9

1. 300,000 litir
2. Joogu = 6 sm
3. b. 3000 mitir seddexjibbaaran t. 500 mitir seddexjibbaaran
   j. 92 mitir seddexjibbaaran
4. b. 5,000,000 sentimitir seddexjibbaaran
   t. 27,000,000 sentimitir seddex jibbaaran
   j. 32,000,000 sentimitir seddexjibbaaran
5. b. 62,000 millilitir t. 5000 mililitir
   j. 96,000 milliliitr
6. b. 2000 sentimitir seddexjibbaaran
   t. 5 sentimitir seddexjibbaaran
   j. 11,000,000 sentimitir seddexjibbaaran.
7. b. 2000 litir t. 5000 litir j. 8000 litir
8. b. 0.3 litir
9. qiyaasta hawada ahi = mugga qolka
   $= 3 \times 5 \times 12 = 180$ mitir seddexjibbaaran
10. V = Bedka salka × Jooga

    $200 = 5 \times 5 \times J$

    $200 = 25\ J$

    $J = \frac{200}{25} = 8$ mitir

Qiimeyn

Waxaad ardayda ku qiimeyn kartaa adigoo weydiya su'aalo afka ah iyo in aad siiso laylis shaqo fasal ahaan iyo shaqo guri ahaanba. Waxaad siin kartaa oo kale laylisyo aad meelo kale ka keentay ha ilaawin'n aad shaqadooda u saxdo si joogta ah. Ardayda ku dhiirigali in ay casharka ka qeyb-qaateen markaaad dhigayso.

Jawaabaha laylisyada nakhtiinka ah (layliska guud)

1. Joogu = 32 ÷ 16 = 2 sm
2. b. xaglaha dhamaysira iyo ku-buuxaha xagasha 20° waa 70° iyo 160° siday isugu xigaan.
   t. xaqlaha dhammaystira iyo kuwa buuxsha xagasho 30° waa 60° iyo 150° siday isugu xigaan.
   j. xaglaha dhammaystira iyo kuwa buuxha xagasha 45° waa 45° iyo 135° siday isugu xigaan.
3. 6 sm

4. 8 sm
5. Ka soo qaad xagashu inay tahay x, dabadeed xagasha ay isbuuxsheen waa (180° - x) dabadeed 180° - $x = 2x + 30°$
   $\Rightarrow 180 - 30° = 3x \Rightarrow 150° = 3x$
   $\Rightarrow 50° = x$
   Cabbirka xagashu waa 50°
6. b. xaglo isku-beegan t. xaglo-gudeed talantaali ah
   j. xaglo foodsaar ah x. haa
   kh. marka ℓ_1 ay barbaro la tahay ℓ_2
7. Ururada tirooyinka (b) iyo (j) waxay noqon karaan kuwo ku calaamadsan dhererada dhinacyada seddexagal.
8. $\angle T$ waa xagasha ugu dheer.
9. $\overline{FG} \equiv \overline{MN}$
10. Marka loo eego dhardhaarka SAS
11. Haa, dhardhaarka SAS
12. **Falanqeyn**
    1. $\overline{BC} \equiv \overline{BD}$ . . . siin
    2. $\overline{CO} \equiv \overline{DO}$ . . . siin
    3. $\overline{BO} \equiv \overline{BO}$ . . . dhinaca ay wadaageen
    4. $\Delta CBO \equiv \Delta DBO$ . . . talaabooyinka 1, 2, 3 iyo dhardhaarka SSS.
    5. Sidaas darteed $\angle CBO \equiv \angle DBO$ talaabada 4 iyo qeexida isu-sargo'naanta seddexagalada.
13. $\Delta MNO \equiv \Delta MQO$ . . . dhardhaarka SSS
    Siddaa awgeed m ($\angle MNO$) = m ($\angle MQO$)
    Laakiin m ($\angle MQO$) = 65°
    Hadaba m ($\angle MNO$) = 65°
14. 2 mitir seddexjibbaaran
15. 5 mitir labajibbaaran

Muqararka Xisaabta Fasalka 6aad

HORDHAC

Andayda fasalka 6aad waa in laga taageero laguna dhiirlgeliyo in ay gaadhaan heer ay xisaabta u isticmaalaan ama u adeegsadan aalado (Tools) ka caawinaya in ay si fiican u falmaan una gartaan waxyaabaha ka dhacaya Agagaarkooda carruurta Anmiysan in ay xisaabtu tahay Aalad faa'iiddooyin badan u leh waxay Horumar la Taaban karo ka gaadhi doonaan dhinaca Aragtida (Attitude) xisaabta. Haddaba iyada oo laga duulayo Hawlgaallo Qorshaysan ayaa Ardayda waxaa lagu dhiirigelin karoo in ay Xisaabta u adeegsadeen Hal-Abuur ahaan iyo Hab-dhis ahaan (Systematically) .Aidaas oo kale iyada oo Ardaydu ay wadaagayaan khibradahooda ayaa waxay xisaabta u adeegsan doonaan in ay tahay sansaanta Isgaarsiin aysaa (Isku xidhaysa) Qeexidda, saadaasha iyo Tarjumidda (Sharraxka bixinta) Taasdarteed xoog saariddooda (Their concentration) iyo isku taxalujintooduba (Their Persistence) waxay ku mutaysan doonaan guulo lagu Qanci karo (Kalsooni lah) oo ay Abaal marin ku helaan.

Caruurta yar-yar waxay u baahan yihiin in laga kobciyo in ay aragti fiican ka haystaan xisaabta, si loo xaqiijiyo in ay ku siqaan (ku soo dhowaadaan) Barashada maadada xisaabta isla markaana ay u arkaan in Barashada xisaabtu tahay Wax fudud Balse aanay is arkin in ay tahay wax gaboobay oo aan la baran Karin Ardayda ku raaxaysata barashada Xisaabta isla markaana Aaminsan in guulo dhaxalgal ah laga gaadhayo xisaabta, waxaa ka muuqda I n ay yihiin kuwo aad u xiisaynaya barashada xisaabta gaar ahaan kuwa aad u Hiyikacsan (Motivated) ee doonaya in aad u baraan xisaabta.Kuwaas oo ah kuwa u arka ku-habboonaanshaha iyo ujeeddooyinka xisaabtu in ay tahay Hawlaha ay maalinkasta Qabtaan.

Abuuridda xaaladdaha Muujinaya Baahida laa Qabo xisaabta isla markaana si fudud loogu Dabbakhi karo xisaabta waa Arin Ahmiyada wey? U leh barashada xisaabta. Waxaa khasab ah in aad Taqaano heer ka bareshada Ardayda (Waxa ay yaqaanaan) iyo Hawlaha xisaabeed ee Ardaydu qabtaan Maalin kasta. Marka Ardayda la barayo xisaabdta, Hawlaha ay ka qaybtqaadanayaan maaha Fikraddaha (Macnaha) xisaabeed oo keliyo balse waa sida xisaabta loola xidhiidhinayo Nolol Maalmeedka Ardayda. Ardaydu waxay baran doonaan in ay Falmaan muhimadda ay xisaabtu u leedahay Natfooda, Tusaale ahaan waxay fahmayaan muhimadda ay tiradu u leedahay in wax ku tirsadaan, muhimadda uu waqtigu u leeyahay in ay sugaan waqtiga cuntada loo karinayo, muhimadda ay Tajebyadu u leeyihiin in ay Qaybo isle'eg u qaybsadaan khudaarta la siiyey iwan.

Ujeeddooyinnka Barashada Xisaabta Faslka 6aad

Aqoontii iyo xirfaddihii ay Ardaydu ku soo barteen xisaabta fasalka 5aad gaar ahaan Hab-dhisyada tirade, xisaabfallada Tirooyinka Doorsoomeyaasha, Isleegyada iyo Dheelliyada, cabbiraadda, Joomateriga, ururinta iyo Habaynta xogaha, iyo Itimaalka waxay noqonayaan kuwo si qolo dheer loogu qaadan doono xisaabta fasalka 6aad Haddaba aqoonta, katida iyo xirfaddaha xisaabeed ee heerarka soo socda ayaa waxaa la filayaa in agu gaadhi doono xisaabta fasalka 6aad

- Tibaaxidda saxda ah ee Erey-bixinta ururrada
- Soo soocidda Harmo-ururrada, Hormo-uruuada Qumman; ururrada isleleg iyo ururada Isudhigma

- Soo Saaridda dhextaalka iyo Isutagga ururrada
- Sawiridda jaantuska Feen oo lagu muujinayo isutagga iyo dhextaalka ururrada iyo furfurista weedh-xisaabeedyada fudud
- Soo soocidda marka Tiro idil ay haraa la'aan u Qaybsami karto 2,3,4,5,6,8,9iyo 10,
- Isku dhufashada Jajabyada iyo Jajab-Tobanleyaasha
- Isuqaybinta Jajebyada iyo Jojab-Tobanleyaasha
- Soo saaridda Dhufsane-yaraha ay wadaagaan (DH.Y.W)iyo Isir-Weynaha ay Wadaagaan (I.W.W) laba, tiro ama saddax Tiro oo Tirooyin Tirsiimo ah oo had-god ama lab-god ah
- Soo soocidda Tirooyinka mutuxan iyo tirooyinka farlan.
- Isbarbardhisidda iyo Horsanaanta Abyooneyaasha iyada oo la adeegsanayo xarriiqda tirade
- Isugeynta Tiyo kalagoynta Abyooneyaasha iyadaoo la adeegsanayo ama aan la adeegsanayn Xarruada Twada
- Jajabka oo loo bedelayo Jajab-tobanle iyo Boqolkuba
- Isku beddidda Jojab-Tobanleyaasha dhammaadka leh iyo Jajabyada midba kana kale
- Isku bedelidda Boqolkiiba oo loo bedelayo Jajabyada Iyo Jajab-Tobanleyaasha
- Isbarbardhigidda iyo Horsanaanta Jajabyada
- Furfurista Islelegyyada iyo Dheelliyada Toosan ee lagu Furfuri karo hal-Tallaabo iyo furfuristooda oo lagu Muujinayo xarriiqda tirade dusheeda
- Sharraxidda iyo Adeegsiga saamigalka Qumman iyo saamigal-Rogaalka ee fuifurista mas'alooyinka
- Sawiridda Garaafyada muujinaya saamigalka Qummaan iyo saamigal-Ragaalka
- Soo saarista kulannada Baraha iyo ku muujinta waaxda 1aad Baraha lagu siiyey Bar-kulannadooda
- Soo saarista wareegga iyo Bedlka saddexagalka labajibbaaranaha iyo laydiga
- Raadinta mugga Biriisam-laydiyeedka
- Isku bedelidda sentimitir labajibbaaran iyo mitir labajibbaaran midba kan kale
- Isku bedelidda sentimitir saddex jibbaaran iyo mitir saddex jrbbaaran midba kana kale
- Furfurista Mas;alooyinka la xidhiidha xaglaha ay sameeyaan laba xarriiqood oo Barbarro ah iyo gudbane.
- Soo soocidda xaslo Deris iyo xaglo faadsaarah iyo xaglo sbuuxsha iyo xaglo sidhammaystiro
- Sharxidda Astaamaha saddexaqalka ee Dhisidda saddexagallada iyo Qeexiddoodaba.
- Soo soocidda saddexagallo isku sargo;an iyada oo la adeegsanayo Tijaabooyinka Isku sargo;naanta saddexagallada (SSS;SAS;ASA)
- Dhisiddda saddexagallada iyada oo laga duulayo cabbirkooda lagu siiyey.

Cutubka: 1aad FIKRADDAHA AASAASIGA AH EE URURRADA
(19 Xisadood)

Ujeeddooyinka Guud ee Cutubkan:
Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan)
Awood u yeelan karaan)

- Fahmidda Fikradda (Macnaha) Urur
- Sharxidda Xidhiidhka ka dhexeeyalaba urur
- Soo Bandhigidda Xisaabfallada (Dhextaalka iyo Isutagga) ururrada

Ujeeddooyinka gaarka ah ee casharka	**Ciwaannada Cutubka, Qaybaha iyo Casharrada**	**Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay**	**Tallaabooyinka Qiimeynta**
Ardaydu waa in ay Awacdi kajaan • Sharxidda waxa uu yahay maanaha urury iyo ku-Tirsaney	1. Fikaraddaha Aasaasiga ah ee uruuada 1.1 Barashada Macnaha ururmda (3xiso)	• Ku dhiirigeli Ardayda in ay ku siiyaan Tusaaleyaal ay nqaskax dooda ka keeneen oo ku saabsaan macnaha urur (Sida ururka Gabdlaha Ardayda Fasalkooda) • Ku hag ardayda in ay la yimgadaan (Keenaan) macnaha uruntadhan iyo Tusaaleyaal sida ururka Ardayda Fasalkiina ee dadoodu tahay 100 sano • Ka caa wi Ardayda in ay Adeegsa daan summaddaha iyo Ereyada la xidhiidha Urur	• Weydii Ardayda in ay soo bandhigaan Tusaaleyaal ku saabsan ururrada
• Sharxidda xidhiidhka ka dhexayn kara ururrada sida Hormo-urur Hormo-urur-Quman ururo isle'eg iyo ururro isu dhigma	1.2 Xidhiidh ada ururrada (6xiso)	• Fursad u sii Ardayda in ay soo soocaan isla markaana si ficil ah ugu celceliyaan Macnaha "Hormo-urur" • Hormo-urur-Qumman ; ururro isleleg "Ururro isu dhisma"	• Sii Ardayda laylis yo kala duwan oo ay ku soo saaro yaan Hormo-ururka hormo ururka Quman ururo isla'eg iyo ururro isu dhigma

		iyaga oo adeeg sanaya Dhawrtusaale oo sawir ahaanah (Tirada ku Tirsaneyaashu waa in aanay ka badnayn 3). Tusaale:-Ka soo qaad A={a,b} soo saaro Hormo-ururka iyo Hormouruka Quman ee ururka "A|" Ururrada {a},{b}, Ø waa Hormo-ururka Qumman e ururka A	

• Soo saaridda dhextaalka laba ururoo la siiyey	1.3 xisaabtallada ururrada (10xiso) 1.3.1 Dhextaalka ururrada	• U Horseed Ardayda in ay sheegaan macnaha Dhextaalka laba urur • Fursad u sii Ardayda in ay sificil ah ugu cal celiyaan soo saaridda dhextaalka laba urur kasta	• Sii Ardayda laylisyo ay ku soo saarayaan Dhextaalka laba urur
• Soo saaridda isutagga laba urur oo la siiyey	1.3.2 Isutagga ururrada	• Ku dhiirigeli Ardayda in ay soo bandhigaan ngacnaha isutagga laba urur • Fursad u sii Ardayda in ay si ficil ah ugu celcaliyaan soo saaridda isutagga laba urur oo kasta	• Si ardayda lalisyo ay ku soo saarayaan isutagga laba urur oo kasta
• Adeegsiga Jaantuska fee nee ku muujirita isutagga iyo Dhextaalka laba urur	1.3.3 Jaantuska Feen	• Ka caawi Ardayda in ay muujiyaan Dhextaalka iyo Isutagga laba urur iyaga oo adeegsanay jaantuska feen • Ku Gacansii Ardayda in ay Furfuraan mas'alooyinka ku saabsan Dhextaalka iyo Isutagga ururada iyaga oo ka duulaya Jaan tuska fee nee la siiyey waxaa aad Adeegsan kartaa Tusaaleyaal la mid ah kana soo socda 1 3 2 4	• Weydii Ardayda in ay soo saaraan Dhextaalka iyo isutagga laba urur kadibna ay ku muujiyaan Jaan tuska feen • Sii Ardayda Jaan tusyo kala duwan oo weydii in ay soo saaraa n Dhextaalka iyo fsutagga ururda 5 7 6

		Raadi kuwan soo socda:- b) A=_____ T) =_____ J) AnB:_____ X) AuB_____ • Ka caawi Ardayda in ay si Ficil ah ugu celceliyaan Furfurista weedh-Xisaabeedyada. Waxa aad Adeegsan kartaa Tusaaleyaal la mid ah kan asoo socda Xubnaha ***Tusaale:-*** Dugsi ayaax Guddiga maadada xisaabtu waxay kala yihiin nuur Yuusuf,Aamina iyo Jamiilo. Sidaas oo kale xubnaha huddiga maaddada Ingiriisiyuna ay kala yihiin Axmed,Nuur, Aamina iyo Faadumo. ***Haddaba*** b) Ku muuji Jaantuska feen tusaalaha t) Soo saar Dhextaarka labada Guddi J) Soo saar isutagga labada Guddi	

CUTUBKA:-2aad Qaybsanaanta (Divisibility) Turooyinka Idil (23Xisaddood)

Ujeeddooyinka Guud ee Cutubkan:

Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Garashada Hababka Jijaabinta in Tiro idil ay haraa la'aan u Qaybsami karto tiro idil oo kale
- Soo Soocidda tirooyinka Mutuxan iyo tirooyinka farcan
- Qoridda isirraynta Mutduxan ee tiro idil oo la siiyey

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
Ardaydu waa in ay Awoodo u yeelan karaan Soo soocida Tirooyinka idil ee Haraa la'aan u Qaybsami kara 2,3,4,5,6,8,9 iyo 10	2- Qaybsanaanta tirooyinka Idil 2.1 Macnaha Qaybsanaanta (6 xiso) • Hababka Tijaabinta Qaybsanaanta	• Ka caawi Ardayda in ay adeegsadaan hababka lagu Tijaabiyo in Tiro idil ay haraa la'aan u Qaybsami karto tiro idil oo kale, isla markaana ay Hubiyaan tirooyinka Idilee Haraa la;aan u Qaybsami kala (la Qaybsheyaasha) 2,3,4,5,6,8,9,iyo 10.	• Sii Ardayda laylisyo kala duwan oo ay ku Tijaabiyaan tirade idil ee haraa la'aan u qaybsami karta Tiro kale
• Soo saaridda Dhufsaneyaasha iyo Qaybsheyaashro Tirooyinka idil ee lasiiyey	2.2 Dhufsaneyaasha iyo Qaybsheyaasha (17xiso) 2.2.1 Naqtiin Dhufsaneyaasha iyo Qaybsheyaasha	• Fursad u sii Ardayda in ay Naqtiin ku sameeyaan habka lagu Raadiyo Dhufsaneyaasha iyo Qaybsheyaasha Tirooyinka idil ee la siiyey.	• Sii Ardayda laylisyoaad ku weydiinayso in ay taxaan Dhammaa Qaybsheyaasha iyo Qaarka mid ah Dhyfsaneyaasha tirooyin la siiyey
• Kala soo cidda Tirooyinka Mutuxan iyo Tirooyink aFarcan • Tixidda Qaalka mid ah	2.2.2 tirooyinka mutuxan iyo Tirooyinka Fancan iyo isirraynt muuxan	• Kacaawi Adayda in ay dhuuxaan waxa ay kala yiihiin tiooyinka mutuxan iyo tirooyinka Farcan. • Ku Dhiirigeli Ardayda in ay taxaan qaarka mid ah	• Weydii Ardayda in ay tirooyinka mutuxan ka so can tirooyinka farcan

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
tirooyinka mutuxan iyo tirooyinka Farcan		Tirooyinka Mutuxan iyo qaarka mid ah tirooyinka Farcan	
• U Qoridda Isirrada mutuxan ee Tirooyinka la siiyey		• Ka caawi Ardayda in ay tirooyinka tirsiimo ee la siiyey ay tiro kasta u Qoraan Taranta Isirradeeda mutuxan iyaga oo adeegsanaya Habka isiirraynta Mudtuxan. Waxa aad Adeegsan kartaa Habka Isirrada Geedaha.	• Sii Ardayda Laylisyo ay ku raad inayaan Isirrad mufuxan ee Qaar ka mid ah Tirooyinka tirsiimo
• Sharxidda macnaha Qaybshaha (Isirka) ay wadaagaan laba tiro oo idil	2.2.3 Qaybshe yaasha (Isirrado) ay wadaagaan	• Fursad u sii Ardayda in ay falnqeeyaan Maanaha Qaybaha (Isirka) ay wadaagaan laba Tiro, Qaybahaha (Isirka) ugu weyn ee ay wadaagaan laba Tiro iyo Tirooyinka ah isku mutuxaneyaasha.	• Sii Ardayda laylisyo rala duwan oo ay ku soo saarayaan Qaybshaha (Isirka) ay wadaagaan iyo Qaybshaha (Isirka) ugu weyn ee ay wadaagaan (I.W.W.) laba Tiro kadibna Hubi shaqadooda
• Shar xidda macnaha Qaybshaha (Isirka) ugu weyn ee ay wadaagaan laba tiro • Soo cidda Tirooyinka ka ah isku mutuxane yaasha		• Ka Gacansi Ardayda in ay soo saaraan Qaybshaha (Isirka) ay wadaagan laba Tiro iyo Qaybshaha (Isirka) iyo weyn ee ay wadaagaan (Q.W.W) ama (I.W.W.) laba Tiro waxa aad adeegsan kartaa tusaaleyaal la mid ah kana soo socdan Tusaale:- Soo saar Qaybshaha (Isirka) ay wadaagaan iyo Qaybshaha (Isirka) ugu weyn ee ay wadaagaa II.W.W.) 36 iyo 60 ✓ Isirrada (Qaybsheyaasho) 36={1,2,3,4,5,6,9,12,18,36} ✓ Isirrad (Qaybsheyaasho) 60={1,2,3,4,5,6,10,12,	

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		15,20,30,60} ✓ Isirada (Qaybsheyaasha) ay wadaagaan 36 iyo 60 waa= {1,2,3,4,6,12} ✓ I.W.W.(Q.W.W) 36iyo 60 =12	
• Sharxiddda macnaha Dhufsaneyaasha ay wadaagaan laba tiro oo la siiyey • Soo saaridda dhufsaneyarahaa ay wadaagaan (Dh.Y.W) laba Tiro ama saddex Tiro oo Tirooyin Tirsiimo ah oo ah hal-godle ama laba godle	2.2.4 Dhufsaneyaasha ay wadeegaan	• Ka caawi Ardayda in ay sharrax ka bixiyaan manaha Dhufsaneyaasha ay wadaagan iyo Dhufsane-yaraha ay wadaagaan (Dh.Y.W) laba tiro ama saddex tiro ooh al-godle ama laba-Godle ah Waxa aad Adeegsan kartaa Tusaale eyaal la mid ah kana soo socda:- ***Tusaale:-*** Soo saar Dh.Y.W 4 iyo 6 Dhufsaneyaasha 4={4,8,12,16,20,24,28,32,36,40,44,48….} Dhufsaneyaasha 6={6,12,18,24,30,36,42,48…} Dhufsaneyaasha ay wadaagaan 4 iyo 6={12,24,36,48…} Dh.Y.W.4 iyo 6 =12	• Sii Ardayda laylisyo kala duwan oo ay ku soo saarayaan Dh.Y.W.laba tiro ama saddex Tiro ooh al-Gode iyo laba-Godle ah kadibna ka Hubi shaqada Arday kasta.

CUTUBKA 3AAD: JAJABYADA IYO JAJAB-TOBANLEYAASHA (41 Xisadood)

Ujeeddooyinka Guud ee Cutubkan:

Citubkani marka uu dhammaado kadib, Ardaydu waxay Awood U yeelan doonaan (Awood u yeelan karaan)

- Fahamka Jajabyada iyo Jajab-Tobanleyaasha iyo Rumeynta in ay yihiin laba ha boo loo muujiyo tirooyin isku mid ah
- Kobcinta Xirfaddahooda ku saabsan Isbarbardhigidda Horsanaanta, Isugeynta,Kalagoynta.Iskudhufashada iyo Isuqaybinta Jajabyada iyo JajabTobanleyaasha
- Ka shaqaynta Masalooyinka iyo weedh-xisaabeedyada ku saabsan Jojabyada iyo jajab-tobanleyaasha.

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
Ardaydu waa in ay Awood u yeelan kanan • Fududaynta Jajabyada ee Tibixda ugu hoosaysa	2. Jajabyada iyo jajab-tobanleyaasha 3. Fududaynta Jajabyada (5 xiso)	• Fursad u sii Ardayda in ay Naqtiin ku sameeyaan Qayshaha ugu weyn ee ay wadaagaan (Q.W.W) ama Isir-weynaha ay wadaagaan (I.W.W.) laba tiro • Ka caawi Ardayda in ay si ficil ah ugu celceliyaan Fududaynta Jajabyada iyaga oo adeegsanaya Q.W.W. (I.W.W) Isla markaana jajabyada u yaraynaya tibixda ugu hoosaysa	• Sii Ardayda laylisyo kala duwan oo ay ku fududay nayaan Jajabyada la siiyey lyaga oo u qoraya Tibixda ugu hoosaysa
• Jajabyada u bedelaan jajab-tobanle iyo Boqollay	3.2 Isku bedel lidda Jajabyada Jajab-joban leyaasha iyo Boqol lilaby (10xiso) 3.2.1 Jajabyada oo loo bedelayo Jajab-Tobanle iyo boqo llay	• Ku hoggaami Ardayda in ay si fiican u dhuuxaan nqacnaha u Qoridda Jajab-Tabanleyaasha (Kuwa Dhamaada iyo kuwa soo noqnoqda) Qiimaha ugu dhow (Soo yareynta Godadka Jajab-Tobanlaha)	• Sii Ardayda laylisyo ah Jajabyada oo la Bedelayo Jajab Tobanleyaal iyo Boqolley tusaale ahaan Weydii
		• Ka caawi Ardayda in ay jajabyada u bedelaan Jajab-Toban leyaal iyo Boqolley (Boqolkiiba) iyaga oo adeegsanaya Isuqaybinta dheer isla markaana Jajab-Toban laha u soo yareynaya	Ardayda in Tirada Ardayda Fasalkooda Tirada wulasha iyo tirade gobdhaha ay u Qaraan Jajab Jaajab-Tobanle

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		laba ama saddex godoo midga ka xiga barta Jajab-Tobanlaha.	iyo Boqolley Adiguna ka hubi shqadooda
• Jajab-Toban leyaasha Dhammaadka leh u bedelaan Jajabyo iyo Boqolley	3.2.2.Jajab-Toban leyaasha Dhammaada oo loo bedelayo Jajabyo iyo Boqolley Boqolkiiba	• Ku Dhiirigeli Ardayda in ay si ficil ah ugu cel celiyaan habka Jajab-Tobanleyaasha loogu dhufto looguna Qaybiyo Jibbaarada 10, marka loo bedelayo Jajabyo iyo Boqolley boqolkuba, iyaga oo Adeegsanaya Tusaaleyaal kala duwan oo la mid ah Tusaalahan soo socdan • Tusaale:- 0,25 iyo 0,5 u bedel Jajab iyo Boqolley • 0.25=0.25x100= 25= 1=25% 100 100 4 0.5 =0.5x10 =5 =1=50% 10 10 2	• Sii Ardayda laylisyo ka kooban nqas'alooyin Jajabtobanleyaasha dhammaadka leh gma soo noqnoyda loogu bedeleyo Jajabyo iyo Boqolley Kadibna itabi shaqadooda.
• Boqolleyda (Boqolkuba Tirada waadata) u bedelaan Jajabyo iyo Jajab-Toban leyaal	3.2.3 Boqolleyda oo loo bedelayo Jajabyo iyo jajab-Tobanleyaal	• Ka caawi Ardayda in ay si ficin ah ugu celceliyaan Habka boqolleyda) Boqolkiiba Tirada ah) loogu bedelo Jajabyo iyo Jajab-Tobanleyaal sida:- 50% =50 =1 =0.5 100 2	• Sii Ardayda laylisyo ah Boqolleyda oo loo badelayo jajab iyo Jajab Tobanle
• Isbarbar dhigidda Jajabyada • Qoridda Horsanaank a Jajebyada	3.3 Isbarbardhigidd iyo horsanaanta Jajabyada (5 xiso)	• Fursad u sii Ardayda in ay Naqtiin ku sameeyaan jajabyada Isudhigma nqacnahooda iyo habka lagu soo saaroba • Ka caawi Ardayda in ay Isbarbardhigaan isla markaana ay Horsanaan u qoraan Jajabyada iyo jajab-Tobanleyaasha	• Sii Ardayda laylisyo kala duwan oo ku sabsan fsbar bardhigidda iyo Horsanaanta Jajabyada iyo Jajab-Tobanleyaasha
• Soo saaridda wadarta Jajabyada iyo Jajab-Tobanle	3.4 Isugeynta iyo kalagoynta Iajabyada iyo Jajab-Tobanleyaasha 3.4.1 Isugeynta	• Ku hay ardayda in ay soo saaraan wadarta Jajabyada iyo Jajab-Tobanleyaasha iyaga oo u bedelaya Qaabka ku habboon (Ka wada dhigaan jajab ama	• Sii Ardayda laylisyo ka kooban mas'alooyin kala duwan oo ah isugeynta

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
yaasha	Jajabyada iyo Jajab-Tobanleyeesha	Jajab-Tobanle).. waxa aad Adeegsan kartaa Tusaalahan kuwo la mid ah	Jajabyada iyo Jajab-Tobanleyaasha
• Furfurista weedh-xisaabeedyada Isugeyntaha		Tusaale:- Raadiwadarta 1+0.8 iyo 1 +0.5 2 3 1+0.8+0.5+0.8=1.3 ama 1+0.5+1+5+1+1=5 2 3 10 3 2 6	• Sii Ardeyda weedh xisaabadyo isugeynah
• Soo saaridda faraqa kalagoynta ee jajabyada iyo jajab tobanle yaasha • Furfurista waadh-xisaabeedyada kala goynta ah	3.4.2 kalagoynta Jajabyada iyo jajab-Tobanleyaasha	• Ku hag Ardayda in ay soo saaman faraqa kalagoynta ee Jojabyada in Jajab-Tobanleyaasha,iyaga oo u bedelaya Qaabka ku habboon. Waxa aad Adeegsan kartaa Tusaaleyaal la mid ah kuwan soo socda Tusaale:-Raadi Faraqa 4 -0.2 iyo 0.75 – 1 5 4 4- 0.2= 4+ 2 =4 + 1 = 3ama 5 5 10 5 5 5 4 – 0.2 = 0.8 -0.2 = 0.6 5 0.75 -1 =0.75-0.25 =0.50 4 (Fadlan kalagoynta ka fogow ama iska ilaali in faraqu noqdo Tabane)	• Sii Ardayda laylisyo ka kooban mas'alooyin kala duwan oo ah kalagoynta Jojobyada iyo Jajabyada iyo jajab-tobanleyaasha • Sii Ardayda weedh-xisaabeedyo kala duwan oo kalagoyn
• Raadinta taranta Isku dhufashada Jajabyada iyo Jajab-Tobanleyaaasha	3.5 iskudhufashada iyo Isuqaybinta Jajabyada iyo Jajab-Toban leyaasha (11 xiso) 3.5.1 Iskudhufashada jajabyada iyo Jajab-Tobanleyaasha	• Fursad u sii Ardayda in ay naatiin ku sameeyaan Iskudhufashada Jajab lagu dhufanayo Jajab kale iyo Jajab-Jobanle lagu dhufanayo Jajab-Tobanle kale. • Ka caawi Ardayda in ay sii ficil ah ugu celcel iyaan Iskudhufashada Jajabyada oo lagu dhufanayo Jajab-Tobanleyaasha iyada oo loo bedelayo Qaabka ku	• Sii Ardayda laylisyo ka kooban mas'alaayin kala duwan oo ah iskudhusashada Jojabyada iyo Jajab-Tobanle yaasha kadibna Hubishaqadooda

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		habboon (Waxa aad Jajab-Tobanlaha u qaadan kartaa kuwa aan ka badnayn laba (2) god oo midly ka xiga barto)	
• Soo saaridda Qaybta Isuqaybinta Jajab-Tobanle loo Qaybinayo Jajab Tobanle kale	3.5.2 Isuqaybinta Jajab-Tobanleyaasha	• Ku Dhiirigeli Ardayda in ay si ficil ah ugu celcel iyaan Isuqaybinta Jajab-Tobanle loo Qaybinayo Jajab-Tobanle kale, iyaga oo la Qaybshaha iyo Qaybshaha Isuqaybinta u bedelaya Tirooyn Tirsiimo kuna dhufanaya Tibbaarada 10 (Sida 10;100;1000….} • Waxa aad Adeegsan Kartaa Tusaaleyaal la mid ah kuwan soo socda	• Sii Ardayda layhsyo kala duwan oo ah Isuqaybinta Jajab-Tobanle loo Qaybinayo Jajab-Tobanle kala kadibna Hudi shaqadooda
• U tibaaxidda Qormo-Saynis tiro Kasta oo tiro Tirsiimo ah oo		Tusaale:- 0.2 ÷0.4 $= \frac{0.2}{0.4} \times \frac{10}{10} = \frac{2}{4} = \frac{1}{2} = 0.5$ 25.6÷0.16 $= \frac{25.6}{0.16} \times \frac{100}{100} = \frac{2560}{16} = 160$ • Fursad u sii Ardayda in ay si sax u dhuuxaan Macnaha Qormo saynis • Kacaawi Ardayda in ay Qormo-saynis u Qoraan tiro Tirsiimo oo la siiyey waxa aad Adeegsan ka taa Tusaaleyaa la mid ah kana soo socda Tusaale:-Qormo-Aaynisu Qor Tirooyinkan lagu siiyey b)216 t)56000 b) $216 = 2.16 \times 10^2$ t) $56000 = 5.6 \times 10^4$	• Sii Ardayda laylisyo kala duwan oo ay Qormo-saynis ugu Tibaaxayaan Tirooyinka Tirsiimo ee la siiyay kadibna Hubi shaqadooda

CUTUBKA 4aad: ABYOONEYAASHA (18 Xiisadood)

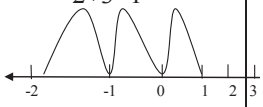
Ujeeddooyinka Guud ee Cutubkan:

Cutubkani marka uu dhammaado kadib, Ardayduwaxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Fahamka Maonaha Abyooneyaasha
- Ku muujinta Abyooneyaasha ee Xarriiqda Tirada Dusheeda
- Soo Bandhigidda Xisaabfallada ah Isugegnt kalagoynta Abyooneyaasha

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
Ardaydu waa in ay Awood u yeelan karaan • Qeexidda ururka abyooneyaasha • Ku Muujinta Abyooneyaasha xarriiada Tirada dusheeda • Sharxidda xidhiidhka ka dhexeeya Uruuada Tirooyinka Tirsiimo, Tirooyinka Idil iyo Abyooneyaasha (N⊂W⊂Z	4.ABYOONEYAASHA 4.1 Barashada Abyoone yaasha (5xiso)	• Fursad u sii Ardayda in ay falanqeeyaan "sababta aan ugu baahanay Tirooyinka Taban" iyaga oo soo bandhir gaya sababo kala duwan sida Heer-ku ka Hooseeya Eber. • Ku hoggaami Ardayda in ay dhuuxaan macnaha Abyooney iyo sumaddooda isla markaana ay Qeexaan ururka Abyooneyaasha sedan:- • $-\mathbb{Z}$ ={…-3,-2,-1,0,1,2,3,….} • Ka caawi Ardayda in ay Abyooneyaasha ku muujiyaan xarriiqda tirade • Fursad u sii Ardayda in ay falan qdeyaan Xidhiidhka ka dhexeeya ururka	• Weydii Ardayda in ay sharrax ka bixiyaan macnaha Abyooneyaasha • Weydii Ardayda in ay Weexaan ururka Abyooneyaaka • Wweydii Ardayda in ay Abyooneyaasha ku muujiyaan xarriiqda Tirada • Weydii Ardayda in ay sharrax ka bixiyaan nxidhiid hka ka dhexey N,W iyo $\mathbb{Z}$

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		tirooyinka Tirsiimo (N) ururka Tirooyinka idil iyo ururka Abvoonevaasha Z iyaga oo ku muujinaya Jaantus ka Feen.	
• Isbarbardhigdda iyo Horsanaanta abyooneyaasha iyaga oo adeegsanaya xarriiqda Tirada • Soo saaridda Horreeyaha io Sambeeeyaha Abyoone kasta oo la siiyay	4.2 Isbarbardhigidda iyo Horsan aanta Abyooneyaasha (5xiso)	• Fursad u sii Ardayda in ay si ficil ah ugu celceliyaan Isbarbardhigidda iyo Horsanaanta Abyooneyaasha iyaga oo ku muujinaya xarriiqda Tirada • Awoodsii Ardayda in ay ku soo gunaanadaan sedan "xariiqda Tirada dushaada tiroba-Tirada ay midiga ka xigto way ka weyn tahay. Sidaas oo kale tiroba-Tirada ay bidix ka xigto way ka yartahay • Ku hacansii Ardayda in ay sheeggaan Horreeyaha in Dambeeyaha Abyoone kasta oo la siiyo	• Sii Ardayda laylis ka kooban mas'alooyin ah isbarabardhigga iyo Horsanaayta Abyooneyaasha • Ardayda Qaarkaad sabuurada ha ku sawiraan xariiqdo Tirada hana ku muujiyeen Abyoone yaasha kadibna haisbarbardhigeen • Weydii Ardayda horreeyaha iyo Dambeeyaha Abyoone kasta oo la siiyey
• Raadinta wadarta Abyooneyaasha • Raadinta faraqa laba Abyoone	4.3 Isugeynta iyo kalagoynta Abyooneyaasha (8 Xiso)	• Fursad u sii Ardayda in ay kala soocaan calaa madda isugeynta iyo calaa mada Tiro togan sidaasoo kala kala socaan calaamadda kalagoynta iyo calaamadda tiro Taban iyaga oo si	• Weydii Ardayda in ay kala soocaan calaamadda isugeynta iyo calaamadda toganaha sidaas oo kala calaamadda kalagoynta iyo calaamadda Tabanaha iyaga oo adeeg sanaya Tibaaxo kala

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		ficil ah ugu celcelinaynaya. Tusaale ahaan 2+3,2-3,-2-3,-2+3,2+(-3),(-3)+(-4). • Fursad u sii Ardayda in ay si ficil ah ugu celceliyaan isugeanta iyo kalagoynta Abyooneyaasha Tusaale:- 1)-2+3 Maanaheedu waa -2 oo loo geeyey 3 siaad isugu geyso ka bilo -2 ka dibnaa dhinaca midig u dhaqaaq 3 Tallaabo -2+3=1  	duwan sida kana ku Qoran tallaabada 1aad ee casharkan • Sii Ardayda laylisyo kala duwan oo ka kooban masalooyin ah Isugeynta iyo kalagoynta Abyooneyaasha

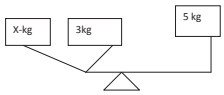
Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		2 (-1) +(-2) Macnaheedu waa -1 oo loogeeyey -2", siaad isugu geyso ka bilow -1, kadibna dhinaca bidix u dhaqaaq 2 Tallaabo (-1) +(-2) = -3  • Ku Dhiirigeli Ardayda in ay ku soo gabagabeeyaan labadan Qodob ee soo socda:- → Haddii Tiro laga	

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		gooyo isla tiradii markaa farqoodu waa Rber (0) Tusaale 2-2 =0; (-1)-(-1) =0 → Haddii tiro loo geeyo ama laga gooyo Eber (0) markaa Tiradii waxba iskama bedelayaan ***Tusaale*:-** 3+0=3; 3-0 =3	

CUTUBKA 5AAD:- ISLE'EGYADA TOOSAN, DHEELLIYADA TOOSAN IYO SAAMIGALLADA (25 XISADDOOD)

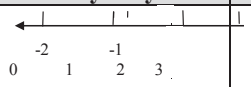
Ujeeddooyinka guud ee Cutubkan:-
Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Kobcinta Xirfaddahooda ku saabssan Furfurista Isle'egyada Toosan iyo Dheelliyada Toosan ee Sansaantoodu tahay X+a=b iyo X+a>a
- Fahmidda macnaha saamigalka Qumman iyo saamigal Rogaalka iyo muujinta garaatyadooda

Ujeeddooyinka gaarka ah ee casharka	**Ciwaannada Cutubka, Qaybaha iyo Casharrada**	**Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay**	**Tallaabooyinka Qiimeynta**
Ardaydu waa in ay Awood u yeelan karaan:-	4. ISLE'EGYADA iyo DHEELLIYADA TOOSAN iyo SAAMIGALLADA 5.1 Furfurista Isle egyada iyo Dheelliyada toosan ee Fudud 5.1.2 Furfurista Islelegyada Tooban		
• Furfurista isla Isle'egyada toosan ee lagu furfuri karo hal-Tallaabo ee sansaantoodu tahay X+a=b		• Fursad u sii Ardayda in ay Naaliin ku sameeyaan Furfurista Isleegyada toosan iyaga oo ku bedelaya Qiimaha Doorsoomaha ee lasiiyey • Ku hoggaami Ardayda in ay si Fiican u bartaan Macnaha miisaamidda islelegta iyaga oo adeegsanaya sawirka Miisaanka sida soo socota X+3=5 	• Sii Ardayda laylisyo kala duwan oo ku saabsan Furfurista isle'egyada toosan ee lagu Furfuri karo hal Tallaabo ee sansaantoodu tahay X+a=b

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		• Ka caawi Ardayda in ay Falanaeeyaan Xeerarka isku bedelidda iste'egyada isu dhigma. " Hadii Isle'egta labadeeda dhinacba loo geeyo ama laga gooyo Tiro isku mid ah markaa Isle'egtii Waxba iskama bedelayaan Balse Waxa aad helysaa isle'eg u dhiganta Isle'egtii hore" sida a = b ⇒ a+c=b+c Halka a,b iyo c Ø Q • Ku dhiirigeli Ardayda in ay Furfuraan Isle'egyada toosan ee lagu Furfuri karo hal tallaabo iyaga oo adeegsanaya Xeerka kor ku qoran X+3 = 5….. labada dhinaaba ka (X+3)-=5-3….. X+(3-3) =2….Hormogelinta X+0 =2 X=2	
• Furfurista Dheelliyada Toosan ee	5.1.2 Furfurista Dheelliyada toosan ooh al-Tallaabo ah	• Ka caawi Ardayda in ay soo bandhigaan	• Sii Ardaayda layhisyo kala duwan oo ku

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
sansaantoodu tahay X+a>b ama X+A<b		in jiritaanka ururka Furfurista ee Dheelliyada Toosan uu ku Tiirsan yahay (Ku xidhan yahay) Horaadka Doorsoomaha iyaga oo adeegsanaya Tusaaleyaal la mid ah Tusaalahan Tusaale:- Furfur Dheelhgan X+2<5 Haddii horaadku yahay ⟷ b) ururka tirooyinka Idil t)ururka tirooyinka tirsiimo J) Ururka Abyooneyaasha ka weyn -4 kana yar 5 =XE (-3,-3,-1,0,1,2,3,4) • Ka caawi Ardayda Hadka loo muujiyo ururka Furfurista Dheeliyada iyaga oo adeegsanaya Xarriiqda tirade Tusale:- Ururka furfurista ee Dheelligon X+2<5, ku muuji xarriiqda tirade Haddii Horaadka Doorsoo maha “X” uu yahay ururka tirooyinka tirsiimo X+2<5 ⇒X<3	saabsan Furfurista Dheell iyada Toosan ee laga dhex helin karo Horaadka la siiyey.

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		 Ururka Furfuristu waa {1,2}	
• Muujinta kulannada hal bar oo ku Taal waaxda 1aad ee Dhidibbada • Sawirldda hal Bar oo ku Taal Waaxda 1aad oo kulannadeed la siiyey	5.2 Bar-kulannada Dhidibbada (6 xiso) • Kulannada Hal Bar	• Fursad u sii Ardayda in ay Naatin ku sameeyaa Xog-ururinta iyo Habiynta Xogaha si ay u akhriyaan una muujiyaan Xidhiidhka iyaga oo adeegsanay sansaanta lammaas eyaasha horsan • Ku hoggaami Ardayda in ay dhuuxaan Hab-dhiska kulanka Dhidibbada Isla markaana ay u akhriyaan barta ay ku kulmaan lammaan aha Horsan ee Hal Bar. • Ka caawi Ardayda in ay muujiyeen kullannada Hal Bar, iyaga oo adeegsanaya lammaaneyaasha Horsan, isla markaana ay meeleeyaan Bar-kulbnnada la siiyey	• Weydii Ardayda in ay Bar la siiyey ku muujiyaan Dhiibbada (Dhidibka X iyo Dhidibka Y) ee waaxda aad • Weydii Ardayda in ay Baraha lammaaneyaal Horsan oo kala duwan ku muujiyduwan ku muujiy aan waaxda 1aad ee Dhidibbada
• Sharxidda saamigalka Qumman iyo	5.3 Saamigallada (12 Xiso)5.3.1 Saamigal Qumman	• Ku hoggaami Ardayda in ay si fiican u dhuuxaan	• Sii Ardayda shax muujinaysa susunta saamigalka

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
Madoorsoomaha (Isirka) saamigalnimada • Soo saaridda madoorsoomaha saamigalnimda ee saamiga ka Qumman		maanaha saamigalka Qumman iyaga oo Adeegsanaya tusaaleyaal Sida Tusaalahan soo socda ***Tusaale:-*** Dukaas ayaa Qalin Qorikasta wux uu ku iibinayaa 50 senti Haddaba 1. Qalin Qiimihiisu waa 1X50 sentii =60 Sentiim 2. Qalin Qiimahaadu waa 2 x50 Sentim =100 Sentiim 3. Qalin Qiimahoodu waa 3x50 sentiim =150 Sentiim 4. Qaliin Qiimahoodu waa 6x50 Sentiim =300 Sentiim Kadibna ha Qeexeen saamigalka Qumman iyo ma doorsoomaha saamigalnimada	Qumman oo weydii in ay soo saaraan madoorsoo maha saamigalnimada iyo Qiimaha ka maqan shaxda sida A 2 3 4 - 6 - B 4 6 - 10 - 14
• Sawiridda Garaatyada saamigalka Qumman • Furfurista weedh-xisaabeedyada		• Ku dhiirigel ardayda in ay soo saran ma-doorsoo maha saamigalnimada iyaga oo ka duulaya shaxda la	• Weydii Ardaydi in ay shaxda saamisalka Qumman u muujiyaan Garaaf ahaan isla markaana ay

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
iyada oo la Adeegsanayo (la Dabbakhayo) Saamigalka Qumman		siiyey • Ka caawi Ardayda in ay Garaafahan u muujiyaan felkerka saamiga ka Qumman • Ka caawi Ardayda in ay furfuran weedh-xisaabeedyada iyaga oo ku dabbakhaya Qeexidda saamiga ka Qumman sida “Haddii 3 mitir oo ka mid ah Dharka yunifoomka Dugsigaaga uu Qiimihiisu yahay 60 Birr waa immisa Qiimaha aad ku soo iibsan karto 5 mitir? • Ka caawi Ardayda in ay sharrax ka bixiyaan Garaat ahaan ma doorsoom aha saamigalka Qumman in uu yahay tiirada xarriqda ee Garaafka.	sharrax ka bixiyaan Dabeec addaha Garaafka • Weydii Ardayda weedh-Xisaabeedyo kala duwan sidao :4 isku joogoo dhar ayaan ka sameysan karaa 16 M oo dhar ah Immisa mitir oo dhar ah ayaanka sermeyn karaa 6 Isku joogoo dheral
• Sharraxida saamigal rogaalka iyo Madoorsoom aha saamigal nimada • Soo saaridda	5.3.2 Saamigal Rogaalka	• Fursad u sii Ardayda in ay Naqtiio ku sameeyaan macnaha saamigale ka Qumman kadibna	• Weydii Ardayda in ay ku siiyaan Tusaaleyaal ay Maskaxdooda ka keeneen oo ku saabsan saamigal Rogaal ka oo

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
madoorsoom aha soo migal nimada ee saamigal Rogaalka		ku hoggaami in ay dhuuxaan saamigal rogaalka iyaga oo adeegsanaya Tusaaleyaal la mid ah kana soo socda:- • ***Tuaaale:-*** Laba Ardayda ayaa ku nadiifin kara fasalkooda muddo 20 Daqiiqo ah waa immisa waqtiga ay saddex Arday ku qaadanayso in ay Nadiifiyaan fasalkooda?	Deggaan kood ah • Weydii Ardayda in ay muujiyaan shaxda saamigal Rogaalka iyaga oo adeegsanaya Garaaf
• Sawiridda Garaafyada saamigal Rogaalka • Furfurista weedh-XB aabeedyada iyada oo ay ku dabbbakhayaan saamigal rogaalka		• Ka caawi ardayda in ay Qeexaan saamigall rogaalka • Ku dhiirlgeli Ardayda in ay soo saaraan ma doorsoo maha saamigal nimada iyaga oo ka duulay shaxda la siiyey	• Sii Ardayda weedh-xisaab eedy ku saabsan saamigal Rogaalka kadibna Hubishaqa dooda

CUTUBKA 6AAD: JOOMATERIGA IYO CABBIRAADDA (44 XISADOOD)

Ujeeddooyinka Guud ee Cutubkan:

Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Soo soo cidda xaalaha
- Caddaynta Saddexagallada isku sargo'an
- Dhisidda Saddexagallada

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
Ardaydu waa in ay Awood u yeelan karaan:- • Kala soo cidda xaglo deris ah iyo xaglo foodsaar ah Qeexndda • Xablo isbuuxsha • Qeexidda xaslo isdham maystira	5.JOOMATERIGA IYO CABBIR AADDA 6.1 Xaslaha (8Xiso) 6.1.1 Xaglaha xidhiidha • Xaglo Derisah • Xaglo foodsaar ah • Xaglo isbuuxsha • Xaglo is dhammaystira	• Fursad u sii Ardayda in ay Dib-u-eegis ku semeeyaan waxa ay ka yaqaanaan xaslaha • Ku hoggaami Ardayda in ay dhuuxaan macnaha xaglo daris ah iyo xaglo foodsaan ah kadibna ku dhiirigeli in ay kala soo can. • Ku haq Ardayda in ay falanqeeyaan xidhiidhka xaglo isbuuxsha iyo kana xaslo isdhammaystira. Isla markaana ay sharrax ka bixiyaan Astaamaha xaglo isbuuxsha iyo xaglo isdhammaystira	• Weydii Ardayda in ay sawiraan laba xaarrigood oo isgoynaya Dabadeedna ay soo soocaan xaslo derisah, Xaglo foodsaar ah iyo xaglo Isdhammayshir • Weydii ardayda in ay sawiraan xaglo isbuuxaha • Sii Ardayda laylisyo kala duwan oo ku saabsan xoglo Isbuuxsha iyo Xaglo Isdham maystira
• Soo soocidda Gudbanaha • Soo Soocidda xaglo-Gudeed talantaalli ah • Soo soocidda Xaglo-Dibadeed Talantaalliah • Soo soo cidda xaglo Gudboon • Caddaynta Isku sargo'naanta cabdirka xaglaha	6.1.2 Xaglaha iyo xarrliqaha Barbarradaah	• Ku hoggaami Ardayda in ay si fiican u bartaan xarrliqaha Barbarrada ah iyo Gudbanaha • Ku hoggaam (Ardayda in ay dhuuxaan xaglo-Gudeed talantaalli ah, xaglaha Gudboon ee ay sameeyaan Xarriiqaha	• Weydii Ardayda in ay sawiraan xarriiqo bar barro ah iyo gudbane • Weydii Ardayda in ay soo soocaan xaglo-Gudeed Talantq lii ah xaglo-Dibadeed Talan taalli ah iyo xaglaha Gudboon • Sii Srdayda mas'alooyin ku

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
ay sameeyaan xarriiqaha Barbarrada ah iyo Gudbanaha • Furfur ista mas'alooyinka la xidhiidha xaglaha ay sameeyaan xarriiqaha Barbarradaah iyo gudbanuhi		Barbarrada ah iy o Gudbanuhu • Fursad u sii Ardayda in ay kala soocaan xaglo-gudeed Talantaalli ah iyo xaglo-Dibadeed tallantaalli ah • Ka caawi Ardayda in ay soo bandhigaan isla markaana soo dhiraan dhiriyaan Isku sargo'naanta xaglo Gudeedka Talan taalliga ah xaglo-Dibadeedka Talantaallig ah iyo xaglaha gudboonba Haddii iyoHaddii oo keliya labada Xarriisood ay yihiin barbarro isla markaana uu gudbane gooyo (Kagudbo) labada xarriiqood ee barbarrada ah iyaga oo a deegsiinaya cabbiraadda xaglaha • Fursad u sii Ardayda in ay Furaan mas'alooyinka la xidhiidha xaglaha ay sameeyaan laba xarr iiqood oo Barbarro ah iyo Gudbanaha	saabsan xaglaha ay sameeyaan laba xarriiqood oo Barbarro ah iyo Gudbane
• Dhisidda saddexagallada Dhereka saddexdooda dhinac la siiyey • Dhisidda saddex agallada la siiyey dhererka laba dhinac iyo cabbirka xagasha	6.2 Dhisidda saddexagal lada (12Xiso)	• Ka Taageer Ardayda in ay dhisaan saddexagallada dhererka dhinacyadooda la siiyey iyaga oo adeegsanaa mastarad iyo goob-Beeq • Ku hoggaami Ardayda in ay soo	• Weydii Ardayda in ay dhisaan saddexagallad marka la siiyo dhererka saddex dhinaca; Dhererka laba dhinac iyo cabbir ka xagasha u dhexaysa; iyo cabbirka laba xaglood iyo dhinaca

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
u dhexaysa • Dhisidda saddexagallada la siiyey labbirka laba xaglood iyo dhexerka dhinaca u dhexeeya • Sharraxidda xidhiidhka u dhexeeya xaglaha iyo Dhinacyada saddexagalka • Sharxidda xidhiidhka u dhexeeya dhinacyada saddexagalka		gunaanadaan Dheelliga saddexagalka ama saddexagalka isma le'ekah ah • Ka Taageen Ardayda in ay dhisaan saddexagallada iyaga oo adeegsanaya mastarad Goobo-Beeq iyo xagal-Beeq b)Marka la siiyo dhererka laba dhinac iyo cabbirka xagasha u dhexaysa labadaas dhinac t) Marka la siiyo cabbirka lab xaglood iyo dhererka dhinaca u dhexeeya labadaas xaglood. • Ku hoggaami Ardayda in ay soo Gunaanadaan xidhiidh ka ka dhexeeya xaglaha iyo Dhinacyada saddexagalka iyo weliba xidhiiidhka ka dhexeeya dhinacyada saddexagalka	u dhexeeya • Sii Ardayda Tirooyin saddex-saddex ah oo u Taagan dhererrada dhinac yada kadibna weydii in dhinac yadaasi ay u taagan yihiin saddexagal iyo in kale • Weydii Ardaydain ay sharrax ka bixiyaan xidhiidhka ka dhexeeya xaglaha iyo Dhinacyada saddexagalka
• Sharraxidda macnaha isku sargo'naanta saddexagallada • Hubinta Isku sargo'naanta saddexagallo la siiyey iyaga oo adeeg sanaya Isdul-dhigid, jeebuda iyo isku laabidda	6.3 Saddexagallo Isku sargoan (12 Xiso) 6.3.1 Isku sargo'naanta saddexagallada	• Fursad u sii Ardayda in ay soo soocaan sawirada leh xajmi Isle'eg iyo Qaab isku mid ah • Ka caawi Ardayda in ay si fiican u dhuuxaan Macnaha shaxannada isku sargo'an iyo sumadda isku sargo'naanta oo ah ≡ kadibna ay sharrax	• Sawir saddexagallo kala duwan kadibna weydii ardayda in ay soo bandhigaan isku sargo naanle saddexagallada iyaga oo ka dullaya Qeexidda isku sargo naanla • Weydii ardayda in ay diyaariyaan saddexagal ku sargo'an saddexagal

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		ka bixiyaan saddexagallo isku sargo'an • Fursad u sii Ardayda in ay Hubiyaan saddexagallada isku sargo'an iyaga o adeegsanaya Isduldhigid Jeebid (Soo goynta Jaanama walax le'eg jaan kale) iyo isku laabidda midba kan kale • Ku Dhiirigeli Ardayda in ay soo Gunaanadaan (Soo Gabagabeeyaan) Iskusargo'naanta saddexagallad iyaga ookala soo caya isku sargo'naanta dhinacyada gudboon (Dhinacyada isku began) iyo xaglaha isku began (Tusaale ahaan waxa aad Isimaali kartaa moodheelada laba saddexagal oo ismale'eka ah oo isku sargo'an)	aad siisay iyaga oo adeegsanaya Isdul dhigidda jeebidda (Goyn) iyo iskulaabidda
• Soo soocidda Isku sarga'naanta laba saddexagal oo la siiyey iyaga oo adeegsanaya Hababka Tijaabinta Isku sargo'naanta Dh.DH;DH.X.DH. iyo X.DH.X	6.3.2 Tujaabinta Isku sargo'naanta saddexagallada (dh.dh.dh;dh.X.dh;iyoX.dh.X)	• Ku hoggaami Ardayda in ay mujiyaan Tallaabooyinka lagu tijaabiyo Isku sargo'naanta saddexagallada Tusaale ahaan si aad u barto Tijaabinta Dhinac-Xagal-Dhinac (Dh.X.Dh)	• Sii Ardayda laba saddexagal sida kuwan soo socda • Kadibna weydii in ay muujiyan Tallaabooyinka soo socda siay u Go'aamiyaan in ay yihiin laba saddexagal oo isku sargo'an

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		Waxa aad casharkan ku bilaabi kartaa labo saddexagal oo la cayimay (la siiyey) Dhererka laba dhinac iyo cabbirka xagasha u dhaxaysa ee hal saddexagal in ay le'eg yihiin labada dhinac iyo xagasha u dhexaysa ee saddexagalka kale. • Ka caawi Ardayda in ay cabbiraan dhinaca iyo labada xaglood ee haray ee saddexagal kasta. Isla markaana Fursad u sii in ay Qoraan waxa u soo baxay • Ku dhiirigeli Ardayda in ay soo gabagabeeyaan ama soo gunaanadaan Isku sargo'naanta labadaas saddexagal iyaga oo ku Tusayalin ay Buuxinayaan Dhammaan shuruuddaha ku Xusan Qeexidda	$\overline{AB} \equiv \overline{DE}$ =(sin 35 m) B ≡ (sin 90^{0}) $\overline{BC} \equiv \overline{EF}$ (siin 45m) $\triangle ABC \equiv \triangle DEF$ (Dh.X.Dh)
		• Ku haggaami Ardayda in ay gaadhaan in ay sheegaan Hawraarta Qeexaysa Dhinac-xagal-Dhinac (Dh.X.Dh) isla markaana furaadu sii in ay Tixraacaan hawraartaas si ay u adeegsadaan Dh.X.Dh	

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		• U Horseed Ardayda iyaga oo oo Raacaya tallaabooyinka kor ku Qoran ee Dh.X.Dh iyo kuwo la mid ah in ay soo bandhigaan Dhimac-Dhinac-Dhinac (Dh.Dh.Dh) iyo xagal-Dhinac-Xagl (X.Dh.D)	
• Qaacidada Bedlka saddexaga lka Qumman ka soo Dhiraan dhiriyaan Bedka Laydiga • Soo saaridda Bedka ssaddex agalka Qumman	6.4 Cabbiraadda (12 Xiso) 6.4.1 Wareegga saddexagallada iyo Bedka saddexagalka Qumman	• Fursad u sii Ardayda in ay Naqtiin ku sameeyaan Bedka laydiga • Ku hoggaami Ardayda in ay Qaacidada (Jidka) lagu helo Bedka laydiga ka soo dhiraandhiriyaan Qaacidada (Jidka) lagu helo Bedka saddex agalka Qumman	• Weydii Ardayda in ay soo saaraan Bedlka saddex agallada Qumman
• Isku bedel idda sentimitir laba Jibbaaran (sm^2) iyo mitir laba Jibbaaran (m^2) midba kan kale • Isku bedeldda Hikdtaar iyo Mitir-labajibbaaran (M^2) • Soo saaridda wareegga saddexagallada		• Ku dhiiigeli Ardayda in ay soo saaraan Bedka saddexagalka Qumman iyago oo adeegsanaya jidka lagu helo Bedka saddexagalka Qumman. • Ka caawi Ardayda in ay isku bedelaan Halbeegyada Bedka sid Isku bedelidda sentimitir laba Jibbaaran (Sm^2) iyo mitir-laba jibbaaran (M^2) midba kan kale iyo Isku bedelidda Hiktarrada iyo miir-labajibbaaran (m^2)	• Sii Ardayda laylisyo ka kooban mas'alooy in ku saabsan Isku bedelidda Halbeegyada Bedka • Sii Ardayda laylisyo ku saabsan soo saar idda wareogga saddexagallada

Ujeeddooyinka gaarka ah ee casharka	Ciwaannada Cutubka, Qaybaha iyo Casharrada	Waxqabadyada Baris-Barrashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		midba kana kale • Ka Taageer Ardayda in ay si ficil ah ugu celceliyaan soo saar idda wareegga saddexagallada	
• Daalifuridda Jidka lagu helo Mugga Biriisaan laydiyeedka • Soo saaridda Mugga Biriisam laydiyeedka	6.4.2 Mugga Biriisam Laydiyaadka	• Ku dhiirigeli Ardayda in ay Daahfuraan Jidka lagu helo mugga Biriisam-laydiyeedka iyaga oo u Qaybinaya saddex jibbaaraneyaal yar-yar oo muggoodu yahay hal sentimitir saddex jibbaaran ($1sm^3$) kadibna Tirinaya Tirada sadddex Jibbaaraneyaasha yar-yar	• Weydii Ardayda in ay sharrax ka bixiyaan Jidka lagu helo mugga Biriisam laydiyeedka
• Isku bedel idda sentimitir saddexjibbaaran ($5m^3$) iyo mitir saddex jibbaaran (m^3) iyo Litirka midba kana kale • Isku bedelidda milliliter (ML) iyo Litir (L) midba kan kale		• Ku xiisageli Ardayda in ay Raadiyaan mugga Biriisam-laydiyeedka • Ka caawi Ardayda in ya si ficil ah ugu celceliyaan Isku bedelidda halbeegyada Mugga sida → Isku bedelidda sentimitir saddex jibbaaran (sm^3) iyo mitir saddex jibbaaran (m^2) iyo Litir (L) midba kana kale → Iskubedelidda Litir (L) midba kana kale	• Sii Ardayda laylisyo kala duwan oo ku saabsan Taadinta Mugga Biriisam Laydiyeedka • Aii Ardayda laylisyo ka kooban masalooyin kala duan oo ku saabsan Isku bedelidda Halbeeg yada Mugga sidao $Sm^3 \longrightarrow M^3$ $M^3 \longrightarrow Sm^3$ $Sm^3 \longrightarrow L$ $m^3 \longrightarrow L$ $L \longrightarrow sm^3 \& m^3$ $Ml \longrightarrow L$