

XISAAB

Tilmaame Bare
FASALKA 8^{aad}



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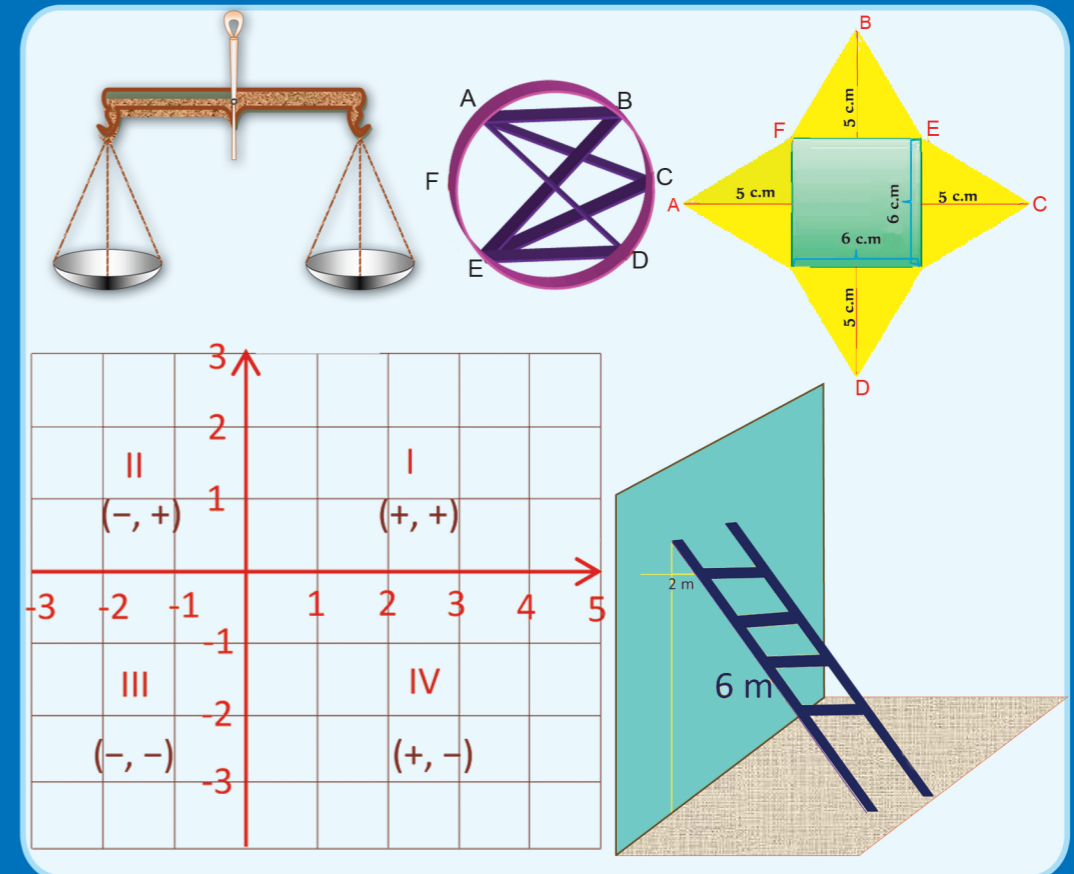
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JAMHURIYADA DIMOQRAADIGA FADARAALKA ITOOBIYA
WASAARADDA WAXBARASHADA

MOE



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WASAARADDA WAXBARASHADA

Birr 47.60

XISAAB

TILMAAME BARE

FASALKA 8^{AAD}

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

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CUTUBKA **1**

LABA JIBAARKA, XIDID LABA JIBAARKA, SADDEX JIBAARKA IYO XIDID SADDEX JIBAARKA

HORDHAC

Cububkan laba ujeedo ayaa laga doonayaa ardaydu in ay awoodaan midda koowaad waa inay ardaydu fahmaan fikrada laba jibaarka, xidid laba jibaarka iyo Saddex jibaarka & xidid saddex jibaarka.

Midda labaad waa in ardaydu awood u yeeshaan isticmaalka. Tusaha tirooyinka iyo furfurista bedadka Kala duwan ee joometeriga Soo saarista xagalgooyaha laydiga qorshaynta beeraha iyo caddaynta tirada geedahu loo qorsheeyay dhul beereed taasoo ku xidhan taariikh nololeedka ardayga.

Wuxuu ku bilaabmayaa cutubkan weedho furan, taasoo lagu siiyey sawirka mawduuca taasoo Saameeynaysa xiisagalinta ardayda, waxaqabadyadani waa kuwo kaa caawinaya caddaynta. Maxay guud ahaan ardaydu ka barten mowduucan iyo habkee ugu tayo badan oolaga bilaabaa barashada mowduucan.

Haddaba waxaa lagu tilmaamayaa in loogu daro layliyo ardaydu si ayna wakhti u lumin fahanka & gudbinta cashirka.

Waa in tusaale lagu siiyaa habkii ay raaci lahaayeen ardaydu.

Ujeedada Cutubka

Marka Cutubkani dhamaado waxay ardaydu awoodi karaan

- * *Furfurista laba jibaarka tirooyinka*
- * *Ka raadinta laba jibaarka shaxda laba jibaarka*
- * *Qeexida Xidid Laba Jibaarka tirooyinka togan eeLakabka leh*
- * *Qeexida Laba jibaarka iyo furfurista tirooyinka xididka tooska uga baxa*
- * *Raadinta xidid laba jibaarka iyadoo la isticmaalayo shaxda xidid lab jibaarka*
- * *Qeexida saddex jibaarka tirada*
- * *Caddaynta saddex jibaaraneyaasha tirooyinka*
- * *Qeexida xidid saddex jibaarka tirada*
- * *Caddaynta tirooyinka xidid saddex jibaarka toos ugabaxa xididka*

Q. Kaabayaasha

Sawir quruxbadan oo midabfiican leh oo lagu sawiro shaxda laba Jibaarneyaasha saddex jibaarane laga sameeyay geed, dhoobo, kartoowaraaq ah.

Barashada Ugu yare ee awood xirfadeed

Marka uu dhamaado Cutubkabni waa inay ardaydu. Sicad u qeexaan ama umuujiyaan Awood Xirfadeedkan.

- * Laba jibaarka tirooyinka lakab
- * Karaadin Laba Jibaarka Shaxda Labajibaarka
- * Raadinta tirooyinka Xididka Toos ka Ugabax
- * Raadin tirooyinka xididka ka baxa shaxdo xididlaba jibaarka
- * Raadinta Saddex Jibaarka tirada
- * Raadinta tirooyinka xidid saddex jibaarka kabax

1.1 LABA JIBAARKA TIRO

Ujeedada Uguwayn ee qaybta waa in ardaydu awoodi karaan raadinta tirooyin Lakab ee laba jibaaran qaybtan waxaan ukala qaadaynaa laba qaybood.

Laba jibaarida tirooyinka Lakabka leh iyo Adeegsiga Shaxda qiimayaasha Laba Jibaarka. Waxaan ku bilaabaynaa Nakhtimida Iskudhufashada tirooyinka Lakabka leh sida. $3.5\frac{1}{2}$ mid.mid marka uu dhamaado Qaybtani Ardaydu waxay Awoodi doonaan

- Fur furista Laba jibaarida. Tirada
- Ka raadin tirada lalaba jibaaray shaxda labajibaarka tirooyinka

1.1.1 Laba Jibaarka tirooyinka Lakab

Waxaad ku soo aragteen fasaladii hoose sida loo raadiyo bedka Laba jibaarane Laydi iwm. Hadaba waxaad awoodaa in aad ka bilawdo cashirka waydiinta ardayda raadi bedka

Tusaalle waydi ardayda raadinta bedka laba jibaarane dhiniciisu yahay 5 & 13. Markaa UtiLmaan in hadii X lagu dhufto x ay le'egtahay X^2

Taas oo ah $x \cdot x = x^2$ (x laba jibaaran ama X kujibaaran labo)

Xus fahasii ardayda inay $x^2 \neq 2x$ taaso $x \neq 0$

Ugu dabayn gunaanadka usheeg ardayda in laba jibaar macnihiisduyahay tirade oo iskudhufto sida $5^2 = 5 \times 5 = 25$

Qiimeyn

Waxaad ku qiimeyn kartaa fahamka ardayda, adigoo afka ka weydiiya inay akhriyaan x^2 , dabadeedna sii macnaha labajibbaarka tirooyinka. Waxa kaloo aad weydiin kartaa inay raadiyaan labajibbaarka tirooyinka ayagoo xisaabinaya.

Ogow inay ardaydu fahantay oo waydii akhrinta x^2 af ahaan kadib usheeg micnaha labajibaarkaa. Tirooyinka dabadeedna Waydii inay Soo Saari karaan laba jibaarida. Tirooyinka.

Jawaabt a Hawlgalka 1.1

1.

Dhinaca labjibaaran (sm)	Bedka Labajibaaran (sm^2)
1	$1 \times 1 = 1$
2	$2 \times 2 = 4$
3	$3 \times 3 = 9$
4	$4 \times 4 = 16$
5	$5 \times 5 = 25$
6	$6 \times 6 = 36$

2. $A = S \times S = S^2$

Jawaab ta Masalada wadarta tirada geedaha bunku waa $20 \times 20 = 400$

Jawaabta Hawlgalka 1.2

1. b) $8sm \times 8sm = 64sm^2$ t) $10sm \times 10sm = 100sm$
 J) $15sm \times 15sm = 225sm^2$ x) $20sm \times 20sm = 400 sm^2$
2. $2sm \times 5sm = 10sm^2$
- 3.

x	1	3	4	5	6	7	9	12	13	16	20
2x	2	6	8	10	12	14	18	24	26	32	40
x²	1	9	16	25	36	49	81	144	169	256	400

Jawaabta Hawlgal 1.3

1. b) $15 = 3 \times 5$ t) $194 = 2 \times 97$
 j) $400 = 2 \times 2 \times 2 \times 2 \times 5 \times 5$ x) $1025 = 5 \times 5 \times 41$
2. Tirada u qormi karta taranta laba tiro oo isku mid ah isirradeeda mutaxani waa tirada 400 ee waana tirade keliya uu xididku si toos ah uga baxayo.

Jawaabta Hawlgalka 1.4

1. b) $4 \times 9 = 2^2 \times 3^2 = (2 \times 3)(2 \times 3) = 6^2$ hadaba 4×9 xididka toos ayay uga baxdaa
- t) $25 \times 16 = 5^2 \times 4^2 = (5 \times 4)^2 = 20^2$ hadab 25×16 toos bay xididka uga baxdaa

2. Laba tiro oo ah a iyo b, Islamarkaa $a^2 iyo b^2$ xididka toos ay uga baxaan iyo sidoo kale $a^2 \times b^2 = (a \times b) \times (a \times b) = (ab)^2$ hadaba $a^2 \times b^2$ xididka toos bay uga baxdaa
3. b) $(55)^2 = 55 \times 55 = 3025$; $(65)^2 = 65 \times 65 = 4225$
 t) $1 \times 2 = 2$, $(2^2) = 2 \times 2 = 4$
 $2 \times 3 = 6$, $(6^2) = 6 \times 6 = 36$
 $3 \times 4 = 12$, $(12^2) = 12 \times 12 = 144$
 $4 \times 5 = 20$, $(20^2) = 20 \times 20 = 400$
- Natiijada taranta laba jibbaarka tirooyinka waxaan u gartay in ay yihiin laba jibbaaraneyaal qumaan.

Jawaabta Hawlgalka 1.5

- b. $\left(\frac{10}{13}\right)^2 = \frac{10}{13} \times \frac{10}{13} = \frac{10^2}{13^2} = \frac{100}{169}$
- t. $\left(\frac{14}{11}\right)^2 = \frac{14}{11} \times \frac{14}{11} = \frac{14^2}{11^2} = \frac{196}{121}$
- j. $\left(\frac{19}{20}\right)^2 = \frac{19}{20} \times \frac{19}{20} = \frac{19^2}{20^2} = \frac{361}{400}$

Jawaabta Laylis 1.1

1. b) $\frac{121}{9}$ t) $\frac{9}{121}$ j) $\frac{289}{10000}$ x) 1.2544
 kh) 0.012544 d) 0.000625 r) 0.00000001
2. tirooyinka 4 iyo 9 waa laba jabbaaraneyaal qumman laakiin $13 = 4 + 9$ maaha laba jibaan quma.
3. wadarta $1+3+4+ \dots + 19 = 100$ hadaba $100 = 10^2$ waa laba jibbaar quman

1.1.2 Isticmaalka Qiimayaasha Shaxda labajibaarane

Waxaadku bilaabi karta Casharka inaad ardayda waydiiso raadinta Labajibaarka tirooyinka adigoo adeegsanaya habka isku dhufashada Tusaale $(4.72)^2 =$ taasoo ah 22.2784, hadaba ardayda bar in mararka qaarkood isticmaalka habka iskudhufashadu ay tahay dhib wakhtigana ay ka dilayso sidaa darteedna loo isticmaallo shaxda laba jibaaranaha la diyaariyay waxaana layidhaahdaa shaxda tirooyinka laba jibbaaran jibaaran

Tus ardayda habka iyo sida looga raadiyo tirada laba jibaaran shaxdan Tusaalle raadi $(4.77)^2$ taas oo ah 22.28 shaxda tirada isbarbardhig Natiijada Marka la adeegsado habka isku dhufashada iyo marka La adeegsado habka karaadinta shaxdan Labajibaarka Kugunaanad in natiijada shaxda laba Jibaarku tahay ugu dhaawaansho.

Hada tus ardayda sida loo raadiyo laba Jibaarka tirada iyadoola Adeegsanayo kaaLkuletarka Sayniska. Kaas oo ah sida ugu fiican eeloo raadiyo Laba Jibaar. Xidid laba Jibaarka saddex Jibaarka iyo xidid saddex Jibaarka Isticmaalka Kaalkuleterka Sayniska.

Jawaabta Hawlgal 1.6

$$b) (5.34)^2 = 28.5156 \quad t) (9.87)^2 = 97.4169 \quad j) (37.4)^2 = 1398.76$$

Jawaabta Laylis 1.2

$$b) 72.93 \quad t) 1254 \quad j) 0.0228 \quad x) 12.82$$

$$d) 85192900 \quad kh) 215.5$$

1.2 XIDIDLABA JIBAARKA TIRO LAKAB

Xiisadaha loo qoondeeyay: 8 Xiiso

Ujeedada ugu wayn ee qaybtan waa in ardayda la Tuso habka loo raadiyo Xidid Laba Jibaar toos Ugabax iyo Xidid laba jibaarka tirooyinka lakabka leh iyadoo La isticmaalayo Shaxda xidid Laba jibaarka taas oo ah lidka sidii looga raadinayay shaxda Laba Jibaarka Qaybtan Waxaan ukala qaadaynaa laba Kuwaas ookala ah Xidid Kasaarida tirooyinkii laba Jibaarane iyo sida Loo istimaalo shaxda Xidid lab jibaarka kabilaw qaybtan Nakhtiimida Qaybta hore ee laba jibaarka tirada marka qaybtani dhamaato waa in ardaydu awoodi karaan

- * Qeexida Xidid laba jibaarka tirooyinka Lakab ee togan
- * Fur furida Xididsaneyaasha toos Uga baxa Xididka
- * Sida looga raadiyo shaxda tirooyinka Xidid laba jibaarka

Jawaabta Masalada

Dhinaca qolkan laba Jibaarane waa 4m. waad waydiin kartaa ardayda bedka fasalka

Jawaabta Hawlgalka 1.7

$$1. 5 \text{ cm} \quad 2. b. 1 \quad t. 3 \quad j. 6 \quad x. 0.1 \quad kh. \frac{2}{3} \quad d. 8$$

1.2.1 Xidid laba jibbaarka jibbaarka qumman

Waxaad ku bilaabi kartaa cashirkan Naqtiimida qaybtii hore ee Laba Jibaarida tirooyinka hadaba waydii ardayda in ay raadiyaan dhinaca Laba Jibaarane bedkiisu yahay 16cm^2 taas oo ah 4m hadaba u Sharax ardayda Xidhiidhka kadhaxeeya laba jibaarka & Xidid laba jibaarka sitoosa Uga baxa xidid laba Jibaarka Tusaale sida $2^2 = 4$ xidid laba Jibaarka 4 na waa 2 hadana $3^2 = 9$ xididlabajibaarka 9 na, waa 3.

Hadaba Utilmaan ardayda gunaanadk araadinta xidid Laba jibaarka Taas oo ah rogaalka habka laba jibaarka tirada. Hadana Tus ardayda hanaanka Isirada Mutaxan ee tirooyinka ay kusoo barten fasaladii hoose Sii Naqtiin ku saabsan Isiraynta mutaxan ee tirada. Taas oo kacaawinaysa Ardayda, inay Isticmaalaan Isirada mutaxan marka ayraadinayaan, xididLabaJibaarka tirooyinka toos uga baxa xidid laba jibaarta habee taranta iyo Isiraynta hadii ay suurogal tahay.

Jawaabta Laylis 1.3

b. 10 x. 30 t. 11 kh. 100 j. 27 d. 29

1.2.2 Isticmaalka Shaxda Xidid Laba Jibaarka

U naqtiin ardayda siday U Isticmaalayeen shaxda laba jibaarka tirada taas oo ah rogaalka Iticmaalka shaxda Xidid Laba jibaarka Hadaba Waxaan Ku raadin karnaa xidid laba jibaarka tirada si lidku ah Laba Jibaarka tirada U sharax sida loo raadiyo Xidid labajibaarka tirada Ardaydu Waxay kusoo arkeen fasaladii hoose sida tirada Lakabka leh loogu qoro JaJabtobanle Sii Naqtiin gaaban oo kusaabsan JaJabtobanalaha Iyo sida tirooyin Udhaxeeya 1.00 iyo 9.99 iyo Jibaarka 10.

Waydiia ardayda raadi inta xidid laba Jibaarkatirooyinka adigoo Istiomaalaya Shaxda Xidid laba jibaarka ugu dar su'aallaha Tiro aan laga hellay shaxda Xidid Laba Jibaarka usheeg ardayda hadii ay ka waayaan shaxda in ay qaadan doonaan tirada ugudhow.

Jawaabta Laylis 1.4

1. b) run t) been j) been x) been

2. b) 3 t) 1.5 j) 21 x) 0.6 kh) $\frac{11}{15}$

3. $\sqrt{0.01} < \frac{1}{2} < \sqrt{\frac{1}{2}} < \sqrt{7} < 3 < \sqrt{10}$

(Ka raadi shaxda laba jibaarane $\sqrt{0.01}, \sqrt{\frac{1}{2}}, \sqrt{7}, \sqrt{10}$)

4. 2, 3, 4, 5, 6, 7, 8, 9

5. Marka 69 ka 64 laba jibaar ahaan loo habeeyo waxaa soo hadhi 5.

6. Laba jibaarka tiro togan Markasta waatiro togan hadaba Majirto tiro lalaba jibbaran oo ah -16 sidaarteed malaha Xidid laba Jibaar -16
7. b) $16 \times 9 = 4 \times 4 \times 3 \times 3 = (2 \times 2 \times 3) \times (2 \times 2 \times 3)$ hadaba $\sqrt{16 \times 9} = 2 \times 2 \times 3 = 12$
- t) $25 \times 49 \times 9 = 5 \times 5 \times 7 \times 7 \times 3 \times 3 = (5 \times 7 \times 3) \times (5 \times 7 \times 3)$ hadaba $\sqrt{25 \times 49 \times 9} = 5 \times 7 \times 3 = 105$
- j) $20 \times 35 \times 63 = 2 \times 2 \times 5 \times 5 \times 7 \times 7 \times 3 \times 3 = (2 \times 5 \times 7 \times 3) (2 \times 5 \times 7 \times 3) = \sqrt{20 \times 35 \times 63} = 2 \times 5 \times 7 \times 3 = 210$
8. b. 15.3 t. 111 j. 0.315 x. 2.09
9. 2.15cm

1.3 SADDEXJIBAAR & XIDID SADDEX JIBAARKA

Ujeedada Ugu wayn ee qaybtani waa in ayardaydu awoodaan raadinta Saddex jibaarka & Xidid saddex Jibaarka tirooyinka

Qaybtan waxaan u kala qaadaynaa laba mida hore saddex jibaarada tirada tan labaadna waa Xidid saddex Jibaarka tirada waxaad Kubilaabi Naqtiin aad ku samayso labajibaarada iyo Xidid labajibaarada waxaad waydiin kartaa ardayda inay saddex jeer isku dhuftaan tirooyinkan 3, 5, $\frac{2}{5}$ mid mid uweydii

Marka ay dhamaato qaybtan waa in ardaydu awoodi karaan

- Qeexida saddex jibaar
- Go'aaminta tirooyinka saddex jibaaran
- Qeexida xidid saddex jibaarka
- Go'aamiinta tirooyinka xidid saddex Jibaarka Kabixi kara xididka

1.3.1 Saddex Jibbaarka Tiro

b. Saddex Jibbaarka tirada

Bilawga Cashirka waad waydiin kartaa ardayda inay Iskudhuftaan saddex jeer tirooyinkan -2, 3, 4 hadaba U hag ardayda in saddex jibaarka tirolakab Macnheedu yahay $x^3 = x \cdot x \cdot x$, Taasaa La Yidhaah saddex Jibaarka saddex Jibaarka Ku gunaanad raadinta Saddexjibaar ku waa iskudhufasho saddex jeer ah.

Waxaad bartaa inaad isticmaasho Isiraynta mutaxan marka aad Hubinayso in tiradu saddex jibaaran tahay iyo inkale jidka isarayn. Isirada mutaxan ee saddex isir noqda markaa tiradaasi waa tiro saddexjibaaran. Waydii ardayda inay raadiyaan saddex jibaarka tirooyinka oo ay ku jiraan jajab iyo jajab tobanle.

Jawaab ta Shaqada Kooxeedka 1.1

Uguhorayn waydii ardayda aad say kooxay Kooxkasa in ay Sameeyaan Ugu yaraan 3 saddex jibaarane oo ay alaabooyin laga heli karo agagaarka sida dhoobo. Geed (Loox) Kartoon, waraaq I.W.M.

Mida Ugu muhiim sani waa in dhamaan kooxuhu haystaan cabbiro Isku mida kadibna ay raadi yaan saddex jibaaraneyaasha dhinacyadood.

1	Sawir	Kani waa saddex jibaarane ah 1 cabbir kaas oo ka samaysan min labo dhinac
2	Sawir	Kani waa 27 saddexjibaarane ah 1 cabbir ah oo min 3 dhinac ah

Jawaabta Hawlgalka 1.8

1. $64sm^3$
2. b. Waa 216 saddex jibaarane t. waa 343 saddex jibbaarane
- 3.

X	-4	-3	-2	-1	0	1	2	3	4
X³	-64	-27	-8	-1	0	1	8	27	64

Jawaabta Hawlgalka 1.9

Isirada mutuxan ee tirada hadii ay saddex noqdaan Markaa Waa sadexjibaar.

Jawaabta Layliga 1.5

1. b) $\frac{1}{8}$ t) 0.027
 j) $\frac{-64}{125}$ x) $\frac{27}{343}$
2. b) waa saddex jibaar quman t) Ma'ah saddexjibaar quman
 j) waa saddexjibaar quman x) ma'aha saddex jibaar quman
 kh) waa saddex jibaar quman d) saddex jibaar quman
 r) ma'aha 3 jibaar quman s) waa saddex jibaar quman

1.3.2 Xidid Saddex Jibaarka

Waxaad kubilaabi Kartaa cashirka Naqtiinka qaybtii hore ee Iskudhufasha tirada Saddex jibaar Ku inay tahay rogaalka saddex jibaarka. Sooqaado tusaallaha soo socda.

$$5^3 = 5 \times 5 \times 5 \text{ hadaba xidid saddexjibaarka } 125 \text{ waa } 5$$

Sidii qaybtii hore waxaad u isticmaali kartaa Isirada mutaxan raadinta Xidid saddex jibaarka. taas oo calaamadiisu tahay $\sqrt{\quad}$ calaamada Xidid saddex Jibaar kuna ay tahay $\sqrt[3]{\quad}$.

Jawaabta Hawlgalka 1.10

1. 5 sm
 2. b) 0 t) 1
 j) 3 x) 4 kh) 10

Jawaabta Laylis 1.6

1. b. $512 = (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2)$

hadaba $\sqrt[3]{512} = \sqrt[3]{(2 \times 2 \times 2)^3} = 8$

t. $2744 = (2 \times 2 \times 2) (7 \times 7 \times 7) = 2^3 \times 7^3 = (2 \times 7)^3$

hadaba $\sqrt[3]{2744} = \sqrt[3]{(2 \times 7)^3} = 14$

$$j. \quad 27000 = (3 \times 3 \times 3) \times (10 \times 10 \times 10) = 3^3 \times 10^3 = (3 \times 10)^3$$

$$\text{hadaba } \sqrt[3]{27000} = \sqrt[3]{(3 \times 10)^3} = 30$$

$$x. \quad 10648 = (2 \times 2 \times 2) \times (11 \times 11 \times 11) = 2^3 \times 11^3 = (2 \times 11)^3$$

$$\text{hadaba } \sqrt[3]{10648} = \sqrt[3]{(2 \times 11)^3} = 2 \times 11 = 22$$

$$kh. \quad 15625 = (5 \times 5 \times 5) \times (5 \times 5 \times 5) = 5^3 \times 5^3 = (5 \times 5)^3$$

$$\text{hadaba } \sqrt[3]{15625} = \sqrt[3]{(5 \times 5)^3} = 25$$

$$b) \quad \frac{2}{3} \qquad t) \quad \frac{10}{7}$$

Jawaabta Layliga Naqtiinka

1. b. ma'aha tiro laba jibaarane quman t. waa tirolabo jibaarane quman
 j. ma aha tiro laba jibaaran x. waa tiro laba jibaarane quman
 kh. waa tiro laba jibaaran
2. b. Waa saddex jibaarane quman t. waa saddex jibaarane quman
 j. waa saddex jibaar quman x. ma ha saddex jibaarane quman
 kh. ma'aha saddex jibaarane quman
3. b. 19.9 t. 3.04 j. 0.9
4. b. 4.04 t. 19.5 j. 23.1
5. 23820.32Bir
6. 0.027
7. b. 6 t. 0.4 j. $\frac{5}{4}$ x. $\frac{13}{20}$
8. b. $\frac{1}{2}$ t. $\frac{3}{8}$ j. -1 x. $\frac{a}{2}$
9. b. run t. run j. been
10. 5: 3 11. 2 12. 10 13. 2

Tusaale Ka sii tiro aan ahayn tiro lakab

CUTUBKA FAAHFAAHINTA KU SHAQEYNTA DOOR SOOMEYAASHA

HORDHAC

Muhimada ugu weyn ee cuttubkani waa in Ardyda lala qabadsiiyo Doorsoomeyaasha iyo in laga dhigo kuwo awood u yeesha si ay ugu isticmaalaan doorsoome yaasha inay ku xaliyaan masalooyinka la xidhiidha nolol – maalmeedkooda ee heerkooda taaso ay kula kulmi karaan maddooyin kala duwan sida sayniska. Laga soo bilaabo heerkoodii fasaladii hoose waxaa lagu soo baranayay tirinta tirooyinka ama mid ku began oo ah isugaynt hal talaabo iyo isugaynta labo talaabo iyo waliba xisaabfalo badan oo leh ururada tirooyinika sid tirooyinka idil, abiyoonada, tirooyinka lakab i.w.l. Ayaa ka shaqeeya la odhan. Cuttubkani wuxuu la micno yahay in ardaydu ku horumaraan heer cayiman oo kala goynta ah sidoo kale waxay si fiican u dabikhi doonaan Istimalka xeerarka Aritmetiga ayagoo isticmaalaya Doorsoomeyaal.

Tusaale ahaan:- Ardaydu si fiican ayey u yaqaanaan in $3 + 4 = 4 + 3 = 7$, xeer la mid ah ayaa laga yaabaa in lagu dabakho Aljebra, halka tirooyinkii lagu bedeley doorsoomeyaal sida: $x + y = y + x$

Baruhu ha ka dhigo mid cad isticmaalka doorsoomeyaashu in uu la mid yahay waxay ku soo qabteen Aritmeetikada tirooyin ka.

Ujeedooyinka Cuttubka

Marka cuttubkani dhammaado dabadeed Ardaydu waxay Awoodi doonaan in ay:-

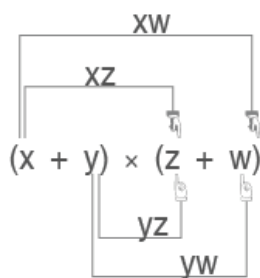
- *Xaliyaan masalooyinka la xidhiidha Nolol maalmeedka ayagoo isticmaalaya doorsoomeyaal*
- *Isku-dhuftaan laba – tibxaale iyo hal – tibxaale, dabadeedna ay go'aamiyaan ama soo saaraan taranata laba – tibxaalaha ah*
- *Go'aamiyaan isirka ugu weyn ee ay wadaagaan tibaaxaha aljebraad.*

Kaabayaasha waxabarasho ee loo doorbiday cuttubka 2aad

Inkastoo tusmooyinka cuttubka 2^{aad} inta badan yahay aljebra, uuna yahay Xisaabin taasoo lagaga shaqeeyo warqad Dusheed, waxaa laga yaabaa in aad u diyaariso, waxyaalo kaabeyaal ah si aad ugu caddeeyso Maareynta Doorsoomeyaasha iyo isticmaalkooda loo isticmaalo qaaciidooyinka kala duwan iyo xalinta Masalooyinka.

- Shax tusinaysa xeerar xisaabeed oo kala duwan
- Shax tusinaysa xeerka Aasaaska isku – dhufashada ee laba – tibxaale lagu dhufto labatibxaale kale.
- Shaxo ka kooban qaaciidooyin kala duwan sida qaaciida Bedka shaxanada joometeri ee kala duwan iyo qaaciidooyinka laysugu bedelo halbeegyada heerkulka ee kala duwan
- Shax tusinaysa sida tibxaha laysugu geeyo marka laba – tibxaale laysku dhufto $(x + y)(w + z) = xw + xz + yw + yz$

$$(x + y)(z + w) = xz + xw + yz + yw$$



2.1 FAAHFAAHIN KALE OO KU SAABSAN TIBXAHA IYO TIBAAXAHA ALJEBRAAD

Xiisadaha loo qoondeeyey: 8 xiisadood

Waxa laga rabo Ardyga

Dhammaadka cuttub – hoosaad kan Ardaydu waxay Awoodi doonaan in ay

- *Isticmaalaan doorsoomeyaasha inay ku caddeeyaan xidhiidhaha Aljebraad iyo kuwo Joometeri*
- *Fududeeyaan qiimeyaasha Ama tibaaxaha Aljebraad ee leh qowska iyo kuwa aa lahaynba.*
- *Xaliyaan masalooyinka la xidhiidha Nolol maalmeedka ayagoo isticmaalaya doorsoomeyaal.*

Erayo Cusub

- Doorsoome, Madoorsoome, tibix, isir, horgale, Horgale tiro ah, Qaaciido, tibaax aljebraad.

Hordhac

Muhimada ugu weyn ee cuttub – hoosaadkani waa in la Nakhtiimo Fikradaha tibxaha aljebraad iyo tibaaxaha kuwaaso Ardaydu ay ku soo barten Fasaladii hoose.

Waxa kale oo la Nakhtiimi waxyaalaha ku saabsan doorsoomeyaasha iyo tibaaxaha cuttub – hoosaadkan waxaa loo qeybiyaa seddex cinwaan hoosaad oo waaweyn qeybta koowaad waxay ka hadashaa isticmaalka doorsoomeyaasha loo isticmaalo qaaciido.

Cinwaan – hoosaadkan, waxaad kaga doodi doontaa sida loogu dabakho door some yaasha qaaciidooyin loo isticmaalo xisaabinta bedadka iyo wareegyada joomatariga.

Cinwaan hoosaadka labaad iyo ka saddexaad waxay ka hadlaan

Doorsoomeyaasha iyo tibaaxaha iyo isticmaalka loo isticmaalo doorsoomeyaasha si loogu xaliyo masalooyinka. Cuttub – hoosaadkan waxaad ardayda u tilmaami doontaa inay fududeeyaan tibaaxo la siiyey ayagoo isu – ururinaya tibxaha isku midka ah xalinayana masalooyinka la xidhiidha Nolol Maalmeedka ayagoo isticmaalaya doorsoomeyaasha.

Gudbinta Casharka

Intaanad siin qeexidaha 2.1 iyo 2.2 iyo 2.3 waxaad casharka ku bilaabi kartaa Adigoo siinaya hawlgalka 2.1 su'aalo afka laga weydiiyo ahaan. Tani waxay ku siin doontaa jaaniska aad ku dabagali doonta Ardayda Aqoonta hore ee ay u leeyihiin cinwaanka. Hawlgalka 2.2 qorsheynta in la qiimeeyo iyo ka dhaadhicinta Ardayda aqoonta caddeeynta hal – tibxaalaha iyo laba – tibxaaleyaasha. Markaad siiso Jawaabaha hawlgalka 2.1 iyo 2.2 u sii layliska 2.1 shaqo fasal ahaan ama shaqo quri.

Jawaabaha hawlgalka 2.1

1. b) $3xy$ t) $3x$ iyo $2y$ j) x, y iyo z x) yzx, x^2y iyo xyz^3
2. lammaaneyaasha (b) iyo (t) iyo (j) waa tibxo isleh, laakiin lammaanaha x ma'aha tibxo isku mid ah

3. xy^2 , $8xy^2$, $-5xy^2$ waxay dhacaan hal koox ah, $-2x^2$ iyo $12x^2$ waxay dhacaan koox hal koox ah, xyz iyo $-5xyz$ waxay dhacaan koox isku mid ah halka y^2 iyo $6y^2x$ ay yihiin kali.

Jawaabaha hawlgalka 2.2

Tibaaxaha aljebraad	Nooca
x	Hal – tibxaale
x^2	Hal – tibxaale
$x^3 + 8xy^2$	Laba – tibxaale
$12x + 5$	Laba – tibxaale
$x + y + z$	Tibxo – badane ama tibaaxo
$3x - 5y$	Laba – tibxaale

Jawaabaha Layliska 2.1

1. b) hal – tibxaale, kaliya tibixda xy
 t) hal – tibxaale, kaliya tibixda $\sqrt{x+y}$
 j) laba – tibxaale waa x iyo $\sqrt{x+y}$
 x) aan ahayn hal – tibxaale iyo laba-tibxaale midna, tibxuhu waa x, y, z
 kh) hal – tibxaale, kaliya tibixda $\frac{xy}{x+y}$
 d) hal – tibxaale, kaliya tibixda $x(x+y)$
 r) laba – tibxaale, tibxuhu waa x^2 iyo y^2
 s) Aan ahayn hal – tibxaale iyo laba – tibxaale midna. Waxaa jira seddex tibxood $xy, xz, iyo yz$.
2. b) 3 t) -1 j) 1 x) $\frac{2}{5}$
3. b) $3y$ t) $-3y^2z$ j) $-5x^3yz^2$

2.1.1 Isticmaalka Doorsoome yaasha loo Isticmaalo Qaaciidooyinka

Halkani waxaa laga yaabaa in aad ku barto Ardayda fikradaha qaaciidooyinka adigoo taxaya waxyaalo ka mid ah

Kuwa aan u isticmaalo Nolosha caadiga ah.

Tusaale ahaan:- Sayniska, waxaa laga yaabaa in Ardaydu ku barten waxyaalo ku saabsan kulka iyo Heerkulka.

Waxa laga yaabaa inay barten waxyaalo ku saabsan halbeega heerkulka iyo sida laysugu badalo heerkul lagu siiyey oo ku cabiran hal – helbeeg aan dhahno digrii sentigiraydh ku kale aan dhahno feeranhayt.

Xidhiidhka ka dhexeeya labada halbeeg waxaa lagugu siiyey qaaciidadan.

$$C = \frac{5}{9} (F - 32) \text{ Ama } F = \frac{9}{5}c + 32$$

Waxa intaa sii dheer in Ardaydu ay isticmaalaan qaaciidooyinka ay ku jiraan hal ama laba doorsoome si ay u xisaabiyaan bedadka iyo wareegyada shaxanada joometeri.

U sheeg ardayda in qaaciida taas oo ay ku furfuri karaan kuwa leh halka doorsoome, marka dhammaan qiimaha doorsoomeyaasha kale lagu siiyo.

Xeer xisaabeedka ku haboon si loogu furfuro doorsoomaha qaaciido ayadoo lagu furfurayo doorsoome kale oo ku jira qaaciida.

- U gee qiime isku – mid ah labada dhinac ee isle’egta.
- Ka jar qiime isku mid ah ama tibxo isku mid labada dhinac ee isle’egta.
- Ku dhufo labada dhinac ee isle’egta tiro ama tibix aan eber ahayn.

Tusaale: ku furfur r qaaciidadan $A = \pi(R^2 - r^2)$

$$A = \pi(R^2 - r^2) \text{ ---- siin}$$

$$\frac{1}{\pi} \times A = \frac{1}{\pi} \pi(R^2 - r^2) \text{ --- Marka lagudhufto labada dhinacba } \frac{1}{\pi}$$

$$\frac{A}{\pi} = R^2 - r^2$$

$$\frac{1}{\pi} + r^2 = R^2 - r^2 + r^2 \text{ --- loogeeyo labada dhinacba } r^2$$

$$\frac{A}{\pi} + r^2 = R^2$$

$$\frac{A}{\pi} + r^2 = \frac{A}{\pi} = R^2 - \frac{A}{\pi} \text{ --- laga jaro labada dhinacba } \frac{A}{\pi}$$

$$r^2 = R^2 - \frac{A}{\pi}$$

$$r = \sqrt{R^2 - \frac{A}{\pi}}$$

$$r = \sqrt{R^2 - \frac{A}{\pi}} \text{ --- labada dhinacba laga saaro xidid laba jibaarka}$$

Jawaabaha shaqo kooxeedka 2.1

Tirada dhinacyada	Tirada xaglo – gooyaha
4	2
6	9
10	35
20	170

Fiiri in qaaciidada tirada xagalgooyeyaasha

N ee geesoolaha tuurta leh ee dhinacyadiisu yihiin n in lagu helo

$$N = \frac{n(n-3)}{2}$$

Geesoole kasta oo tuur leh waan sawiri karnaa xagal – gooyihiisa marka laga reebo labada gees ee is – xiga ee geesoolaha iyo geeska lagu siiyey laftiisa sidaas awgeed waxaan haysan karnaa $n(n-3)$ oo gees laba gees ee A iyo B xagal – gooyaha laga soo sawiray A ilaa B waxuu la mid yahay ka laga soo sawiray B ilaa A.

Sidaa awgeed waxaan u qeybineynaa maxsuulka xagga sare waxaa loo qeybin 2. Silooga hortago in aan la laba tirin, tani waxay ina siineysaa qaacidadii aan rabnay ee xagga sare leynagu siiyey.

Hadda wey fududahay in aan soo saarno tirada xagla – gooyeyaasha ee geesoole dhinacyadiisu yihiin inay tahay 4850.

Tani waxa laga yaabaa in ay adkaato in la helaa ayadoon la istimaalin qaaciido – ama habab kale.

Ayadoo lagu qabanayo koox ahaan, xubin kasta oo kooxda ka midahi waa in uu isku dayo isaga laftiisu.

Adiga shaqadaadu waa inaad ku wareegto Ardayda, aanad tiiriso kuwa u baahan caawimo, dhammaadka, weydii qaar ka mid ah Ardayda inay ku soo bandhigaan shaqadoodii sabuurada.

Jawaabaha Shaqo Kooxeedka 2.2

1. Tibixda boqolkii ba waxay u taagan tahay ama ay lamid tahay 1 boqolkiiba x – waa 10y boqolkiiba waxayna u dhigantaa $x = \frac{10y}{100}$ ama $x = \frac{1}{10}y$
2. Bedka guud waxaa lagu helaa $A = \ell \times w$ laakiin geed kastaa waxuu buuxinayaa bed dhan $4m^2$, hadaba dhammaan bedka dhulka ay ka kooban tahay A waa in u qeybsantaa 4, tani waxay dhici kartaa haddii ℓ ama w midkood u qeybsamo 4 ama w iyo l labaduba yihiin dhaban.

Tusaale gaar ahaaneed:

$$\ell = 2m, w = 6m \text{ ama } \ell = 17m, w = 8m$$

Jawaabaha layliska 2.2

1) 4 2) 9 3) 7 4) 6 5) 4 6) 2 7) 22

8) 12 9) 1.5 10) 4 11) 27 12) 81 13) 0

14) 48 15) 32 16) 10 17) 2 18) 6 19) 2

20) 2 20) 4

21) $\ell = \frac{B}{w}$ t) $v = \frac{2s}{t} - U$ j) $y = \frac{p - a}{x}$

x) $a = \frac{v - u}{t}$ kh) $r = \sqrt{\frac{A}{4\pi}}$ d) $r = \sqrt{R^2 - \frac{A}{\pi}}$

r) $\frac{u^2 - y^2}{2a}$ s) $k = \frac{2B - 5m}{3}$

22. $240.6255m^2$ 23. $35 sm^2$ 24. $212^\circ F$

2.1.2 Doorsoomeyaasha, Tibxaha iyo tibaaxaha

Cutub – hoosaadkani waxay aad u khuseysaa fududeynta tibaaxaha Aljebraad ayadoo ay ku caawinayaan xeerar – xisaabeedka ku habooni.

Ujeedaduna waa inaad hubisaa ardaydu inay la qabsadeen tibxaha lagama – maarmaanka ah sida doorsoomeyaal, tibxo iyo tibaaxo Aljebraad.

Halkan waxaad kari kartaa:-

- Inaad Nakhtiinto macnaha ama fikradaha tibxaha isku midka ah iyo kuwa aan isku midka ahayn.
- Inaad u tilmaantid ardayda inay fududeeyaan tibaaxaha Aljebraad ayag oo isku ururinaya tibxaha isku midka ah.

Waxaad bari kartaa tibxaha isu midka ah adigoo siinaya qeexida caadiga ah, dabadeedna u gudbaya sida loogu dabakho Nolosha dhabta ah, Tusaale ahaan.

Waxaad weydiin kartaa

Su'aasha sida:-

Haddii Nin haysto laba gobol oo xadhiga dabka ah oo mid yahay 1m dhererkiisu ka kalena yahay dhererkiisu 12sm waa maxay dhererka xaddiga uu haystaa?

Halkan dhererka laguguma siin halbeeg isku mid ah sidaas awgeed, ardaydu waxay samayn doonaan inay isu – geeyaan labada halbeeg ee aan islahay sida $1 + 12 = 13$, si ay uga jawaabaan waxay dhihi 13m ama 13sm, ayagoon

U bedelin halbeeg ka kale sida:-

$$1m + 12sm = 100sm + 12sm = 112sm$$

Ama $1m + 12sm = 1m + 0.12m = 1.12m$ u sheeg arday in xaaladaha la midka ee la adeegsado doorsoomeyaasha, aanu qof ku soo gabagabaynayni in wadarta x iyo $2y$ ay tahay $3x$ ama $3y$, ayagoon dhahayn $x + 2x = 3x$ ama $y + 2y = 3y$.

U sheeg ardaydaada xeerarka xisaabta ee L agama – maarmaanka ee loo isticmaalo talaabo kasta marka la fududeyn ayo

Tusaalaha 1^{aad}: $x + 2y + 3x$

$(x + 2y) + 3x$ ---- Astaanta hormogalinta

$(2y + x) + 3x$ --- Kala hormarinta isageynta ee tibxaha qowska ku jira

$2y + (x + 2x)$ --- Astaanta hormogalinta

$2y + 3x$ --- isugeynta tibxaha isu midka ah

Tibaaxda u dambeysaa ma sii fududeysmayso waayo waxaa ka muuqda tibxo aan isu mid ahayn sida $3x + 2y$, kuwaasoo aan loo tixgalinayn in la sii fududeeyo.

Ogow: ku caawi ardyda in ay tibaaxaha Aljebraad u sii fududeeyaan heer ka ugu hooseeya ee suurtoogalka ah.

Adigoo eegaya xeerar – xisaabeedka ee lagama – maarmaanka ah waxaad bari kartaa ardayda isticmaalka qowsas ka iyo sida loo kala horaysiinayo xisaabfalada sida:-

Kala Horsanaanta xisaabfaladu waa sidan:-

1. Furfur qowsaska, haddii ay jiraan, dabadeed haday u baahan yihiin qiimee. Haddii ay yihiin in ka badan laba qows, ka bilow ka ugu xigga gudaha.
2. Furfur ama qiimee jibaarada, waa tirada kujibaaran.
3. Haddaad u qeybisid ama ku dhufatid waxba dhici maayaan.
4. Ugee ama ka goo.

Tusaale: Fududee

$$\begin{aligned} 2y - \{2x - [(4y - 3(x + y))]\} &= 2y - \{2x - [4y - 3(x + y)]\} \\ &= 2y - \{2x - [(4y - 3x - 3y)]\} \text{ --- ayado la baabi'iyey qawskii ugu } \\ &\hspace{10em} \text{hooseeyey} \\ &= 2y - \{2x - [(y - 3x)]\} \text{ --- laysu geeyey tibxaha isu midka ah} \\ &= 2y - \{2x - y + 3x\} \text{ --- la baabi'iyey qawskii labaad} \\ &= 2y - \{5x - y\} \text{ --- laysu geeyo tibxaha isu midka ah} \\ &= 2y - 5x + y \text{ --- la baabi'iyey qawskii saddexaad} \\ &= 3y - 5x \text{ --- laysu geeyey tibxaha isu mid ka ah.} \end{aligned}$$

Jawaabaha Hawlgalka 2.3

1. b) 60
t) Afar xisaabfal
j) haa, tusaale ahaan xisaafalka isugeyntu waxaa la qabtaa xisaabfalka isu-dhufashada horteed; qowska dhexdiisa jawaabtu waa inay noqoto 180. Taasoo ka duwan maxsuulka saxna aan ahayn.
2. 7.25 Afar xisaabfal ayaa ku jira

Jawaabaha hawlgalka 2.4

1. b) haa, waa isku mid
t) haa, waa isku mid
2. qofkasta oo beeraley ahi dhulbeereedka uu haystaa waa 500m^2
3. qofkastaa wuxuu qaatay 27Birr mudolaba casho ah. Sidaa darted majiro qof qaatay Birr badan Ama kale.
Astaan xisaabeedka aan helkan ku isticmaalay waa Astaanta kala horumarinta isu – geynta
 $12 + 15 = 15 + 12 = 27$
 $100\text{m} \times 5\text{m} = 5000\text{m}^2 = 50\text{m} \times 100\text{m}$
4. b) $x - 2y \neq 2y - x$ maadaama oo astaanta kala horumarintu aanay ogolayn kala goynta.
t) $x + 2y = 2y + x$ sababtoo ah astaanta kala horumarinta isugeynta
j) $x - 2y = -2y + x$ maadaama $x - 2y = x + (-2y) = -2y + x$

Jawaabaha Hawlgalka 2.5

1. b) Marka $x = 5, y = 6, z = 10$
 $xy + xz = 5 \times 6 + 5 \times 10 = 30 + 50 = 80$
t) Marka $x = -25, y = 16, z = 8$
 $xy + xz = -25, y = 16, z = 8 = -400 - 200 = -600$
 $x(y + z) = -25 \times (16 + 8) = -25 \times 24 = -600$
2. b) Marka $x = 12, y = 8, z = 3$
 $xy - xz = 12 \times 8 - 12 \times 3 = 60$
iyo $x(y - z) = 60$
t) marka $x = 11, y = -8, z = -4$
 $xy - xz = -44$ iyo $x(y - z) = -44$
3. $y(y + z) = xy + xz$ iyo $x(y - z) = xy - xz$

Jawaabaha Hawlgalka 2.6

1. b) $1 + 2 + 3 = 1 + (2 + 3) = 6$
 $1 + 2 + 3 = (1 + 2) + 3 = 6$

- t) Jidka kale ee aau kaga shaqayn karno waa innaga oo adeegsano astaanta kala dhigga iskudhufashada ee isugaynta.

$$1 + 2 + 3 = 1 \times 1 (1 \times 2 + 1 \times 3) = 6$$

- j) Isbarbardhigga t & j waa isku mid = 6

2. $(x + y) + z = x + (y + z)$

Sidaas darteed;

$$(x + y) + 2 = x + (y + z)$$

3. b) $1 + 2 + 3 = 1 + (2 + 3) = 6$

t) $(x \times y) \times z = x \times (y \times z)$

Jawaabaha Layliska 2.3

1. b) $x + 5x = (1 + 5)x = 6x$ t) $3x - x = (3 - 1)x = 2x$
 j) $-x - 3x = (-1 - 3)x = -4x$ x) $x - 11x = (1 - 11)x = -10x$
 kh) $x + 5x + 7x = (1 + 5 + 7)x = 13x$
2. b) $xy + x^2y^2 = xy(1 + xy)$ t) $4x + 8xy = 4x(1 + 2y)$
 j) $3x^2y + 6xy = 3xy(x + 2)$ x) $3xy + 6x^2y^3 = 3xy(1 + 2xy)$
 kh) $5x - 10x^2 = 5x(1 - 2x)$
3. haa, isku – dhufashadu waxay kala – dhigi kartaa tiro wadaro ah oo aan dhammaan, 3, 4, 5, iwm sida:- a $(x + y + z) = ax + ay + az$.
 Sidan si la mid ah ayaa la sameyn tibxaha ku jira qowsaska ee ay isu – xidhaan kala goyntu.
4. b) laba jid oo kala duwan
 $(x + 2x) + 5x = 3x + 5x = 8x$
 Ama $x + (2x + 5x) = x + 7x = 8x$
 t) shan ji d oo kala duwan
 $(x + 2x) + (3x + 4x) = 3x + 7x = 10x$
 $x + ((2x + 3x) + 4x) = x + (5x + 4x) = x + 9x = 10x$
 $(x + (2x + 3x)) + 4x = (x + 5x) + 4x = 6x + 4x = 10x$
 $X + (2x + (3x + 4x)) = x + (2x + 7x) = x + 9x = 10x$
 $((x + 2x) + 3x) + 4x = (3x + 3x) + 4x = 6x + 4x = 10x$
5. b) $x + (3x + y) = (x + 3x) + y = 4x + y$
 t) $5y^2 + (y^2 - 2xy) = (5y^2 + y^2) - 2xy = 6y^2 - 2xy$
 j) $(x + y) - 3y = x + (y - 3y) = x - 2y$
 x) $(2x + 3) + 12 = 2x + (3 + 12) = 2x + 15$
6. maya, tibxaha isku midka ah ee x iyo 5x waxaa kala qeybiya tibixda 2y, dabadeed waa in la isticmaalaa astaanta kala horumarinta
 Sida: $(x + 2y) + 5x = (2y + x) + 5x$ --- Astaanta kala horumarinta isu geynta
 $= 2y + (x + 5x)$ --- hormogalinta isugeynta
 $= 2y + 6x$ --- isugee tibxaha isu midka ah.
7. b) $6x + 15$ t) $4pq^2 + 4p^2q^2$ j) $5p + 5$
8. b) $-5m^2 - 4n + 18$ t) $5r + 4s$ j) $20 - 9x$

2.1.3 Adeegsiga doorsoomaha Si loo furfuro Masalooyinka

Labadii qaybhoosaad ee cutubkan, Ardaydu waxay soo sameeyeen fududaynta tibaaxaha aljebraad iyo isticmaalida doorsoomeyaasha loo isticmaalo qaaciidooyin. Si kastaba ha ahaatee waxyaalaha ugu muhiimsan ee loo isticmaalo doorsoomeyaashu waxa laga yaabaa inay yihiin furfurida masalooyinka.

Ardayda waxaad weydiin kartaa

Ka soo qaad in Aabaha uu shaqaalee-yey shaqaale Bishii qaata 900 Birr

Si kastaba ha ahaatee waxuu eryey shaqaalihisii 21 casho ka dib.

Waa imisa lacagta la siin karaa shaqaalaha?

Furfuris: ka soo qaad inay tahay qiyaasta lacag ah ee uu bixin lahaa 21 casho 900 birr bishiiba waxay u dhigantaa $(900 \div 30) = 30$ maalintii, dabadeed lacagta we bixinayo 21 casho waa $x = 21 \times 30$ Birr = 630 Birr

Hawlgalka 2.7

- Wadarta da'daha Axmed iyo Awowgii Aabo ee hadda waa 68
 Sidaa darted $x + y = 68$, $y + 3 = 6(x - 1)$ (1)
 Isle'egtan labaad waxan heleynaa $y = 68 - x$ marka lagu bedelo isle'egtii koowaad waxaan heleynaa
 $(68 - x) + 3 = 6(x - 1)$
 Waxaa u dhigma $71 - x = 6x - 6$
 $71 - x = 6x - 6$
 Waxaa u dhigma $71 + 6 = 6x + x$
 Waxaa u dhigma $77 = 7x$
 Tani waxay ina siisaa $x = 11$ sidoo kale $y = 68 - 11$, $y = 57$
 Hadaba Axmed da'diisu hada waa 11 ta Awowgii Aabona waa 57.
- Ka soo qaad in da'da Daahir tahay x , da'diisu laba sano ka dib waxay noqon $x + 2$, da'diisu saddex sano horteed waxay ahayd $x - 3$, markaan u eegno masalada waxaan heleynaa $\frac{1}{2}(x + 2) + \frac{1}{3}(x - 3) = 20$

Si u dhiganta $3(x + 2) + 2(x - 3) = 120$
 --- Marka lagu dhufta dhinac kasta 6 (lcm).
 Waxaa u dhigma $3x + 6 + 2x - 6 = 120$ --- Anagoo
 --- isticmaalayna astaanta kala - dhiga
 Waxaa u dhiganta $5x = 120$ ---
 --- marka la fududeeyo
 Sidaa awgeed $x = \frac{120}{5} = 24$, da'da hadda ee Daahir waa 24 sanadood
- 200 Birr

Jawaabaha hawlgalka 2.8

Ereyo ama weedhahaan	Tibaaxaha Aljebraad oo summadahaan ah
Lix lagu dhuftay tiro	$6x$
Tiro Lix lagu daray	$x + 6$
Lix laga jaray tiro	$6 - x$
Tiro laysku dhuftay seddex jeer	x^3

Jawaabaha layliska 2.4

1. b) 30 t) 34 j) -13 x) 6 kh) 12.25
 d) $x + 25, y = 75$ r) $x = 2, y = 20$ s) $y = 12$
 Ama $x = -2, y = -20$ $x = -2, y = -20$
 sh) $x = 1, y = 1$
2. 3 3. $X = 7, 8, 9$ 4. 29, 31, 33 iyo 35
5. 4 sano, 7 iyo 10 sano
6. 77 dumar ah, 84 rag ah iyo 100 caruur ah
7. $7m$
8. 3 sanadood iyo 9 bilood
9. 25 sano iyo 40 snao
10. 5 birr iyo 9 Birr
11. 60km/saac

Qiimeyn

Had iyo jeer waxaad u baahan tahay inaad ka fikirtid in Ardaydu inta ugu yar ee la rabay ardaygu inuu helo iyo waxbarashada cuttub – hoosaadkan waxa ka soo baxay halkan waxaa laga yaabaa inaad isticmaasho habab qiimeyneed oo kala duwan si aad u hesho jawaab celin ku saabsan fahamkooda. Sii masalooyin laylis ah, su'aalo la xidhiidh Nololsha, su'aalo Afka ah, shaqo kooxeed, hawlgalfasal, shaqo guri iyo shaqo guri ahaan waxay kaa caawin doonaan inaad qiimeyso Ardaydaa.

Miyaad dhaqan u leedahay inaad weydiiso laba su'aalo oo afka ah marka casharku dhammaado maalinkasta ama aad u qorto? Tani waxay kaa caawin doontaa in aad ardayda ku dhiiri galisid inay ka qeybgalaan hawlgalka casharka maalinkasta weyna Akhriyi doonaan casharkana.

2.2 ISKU – DHUFASHADA LABATIBXAALEYAASHA

(7 Xiso)

Waxa laga rabo ardayga

Dhammaadka cuttub – hoosaadkan,

Ardaydu waxay Awoodi doonaan in ay:-

- *Go'aamiyaan taranta hal – tibxaalaha iyo laba – tibxaalaha*
- *Go'aamiyaan taran laba – tibxaaleyaasha*

Erayo Cusub

- Laba – tibxaale, hal – tibxaale, Badh – isku dhufashada iyo Isirada.

Hordhac

Cuttub – hoosaadkii u horeeyey ee cuttubkan Ardayda waxaa lagu baray Erey – bixino la xidhiidha cuttub – hoosaadka oo muhiim ah sida:- tibxo, hal – tibxaale, laba – tibxaale iwm, waxaa jira tibxo la mid ah oo ay ka midyihiin seddex – tibxaale, tibxaale iyo sidoo kale. Qeybtan Ardaydu waxay ku baran doonaan sida laysugu dhufto hal – tibxaale, haltibix oo tibaax aljebraad laba tibxaale, iyo tibaax aljebraad oo leh laba tibxood iyo sidoo kale raadinta taranta laba laba – tibxaaleyaal.

Gudbinta Casharka

2.2.1 Isku – dhufashada hal – tibxaale lagu dhufto Laba – tibxaale

Waxaa laga yaabaa inaad Ardayda u sheegta in xeerka isku – dhufashada ee loo Adeegsaday ku dhufashada lagu dhufta hal – tibxade laba tibxaale uu yahay xeerka kala dhiga isku – dhufashada ee isu – geynta.

Haddaad weydiiso Ardayda maxsuulka $3x(4 + 5)$ waxay ku jawaabi 27, ha ku dhuftaan 3 wadarta 4 iyo 5 taas oo ah 9 ama ha ku dhuftaan midkasta oo ka mid ah tirooyinka ku jira qowska 3 dabadeedna ha isu geeyaan.

Sida:- $3x(4 + 5) = 3 \times 4 + 3 \times 5 = 12 + 15 = 27$ fikrada cusub ee laga yaabo in halkan lagu baro waa in tibaaxaha aljebraad ee ay ku jiraan doorsoomeyaashu ay qaadan karaa tiro saafi ah ama madoorsoome.

Ardaydu waxay sii yaqaaneen sida laysugu geeyo tibxaha isu midka ah,

Tusaale ahaan:- $x + 2x = 3x$

Waxaa laga yaabaa inaad doorbidid hab kale sida:-

$$x + 2x = 1 \times x + 2 \times x = (1 + 2) x = 3 \times x = 3x$$

Tani waxaad bari kartaa taranta doorsoomaha x kaasoo ah hal – tibxaale iyo wadarta labada tiro

Talaabada ku xigta waxaad tixgalin laba xaaladood.

3. Isirka hal – tibxaalaha ahi waa tiro sida kuwa ku jira qowska dhexdiisa

$$3(x + 5) = 3x + 15$$

Noocaan waxaad bari kartaa Adigoo u qoraya

$$3(x + 5) = (x + 5) + 5) + (x + 5)$$

$$= (x + x + x) + (5 + 5 + 5)$$

$$3x + 15$$

4. Isirka hal – tibxaaluhu waa tiro, tibxaha qowsku ku jiraana waa doorsoomeyaal

$$3(x + y) = 3x + 3y$$

Halkan waxaad ku bilaabi kartaa

$$3(x + y) = (x + y) + (x + y) + (x + y) = 3x + 3y$$

Dabadeedna waxaad u gudbi kartaa si guud ahaaneed

$$a(x + y) = ax + ay$$

looma baahna a inay ahaata tiro tirsiiimo.

Waxa ku xiga ee aad siinaysaa waa Raadinta taranta hal – tibxaale iyo laba – tibxaale taasoo mid ka mid ah tibxaha laba – tibxaaluhu uu yahay doorsoome sida isirka hal – tibxaalaha.

Tusaale ahaan: $x(x + 2) = x^2 + 2x$ Ama $x(y + 2) = xy + 2x$

5. Dabadeed tixgali marka laba – tibxaalaha t iyo labadeeda tibxoodba yihiin doorsoomeyaal.

Tusaale ahaan: $x(x + y) = x^2 + xy$

6. Ugu dambeyntii tixgali xaalada (marka) tibxaha laba – tibxaalaha iyo hal – tibxaaluhuba ay yihiin si guud.

Tusaale ahaan: $3xy(2x + 4y) = 6x^2y + 12xy^2$

Ogow:

Waa inaad ku bilwdaa tusaale muuqda oo fudud, dabadeedna aad timaado maxsuulka ama gabagabada

Tusaale ahaan:

Maraaci kartid si aad u heshid tarnanta $\sqrt{3}(x + 5)$ si aad uga shaqeysay $3(x + 5)$ ee ahaa $3(x + 5) = (x + 5) + (x + 5) + (x + 5) = (x + x + x) + (5 + 5 + 5) = 3x + 15$

Jawaabaha Hawlgalka 2.9

1. $10 \times (12 + 13) = 10 \times 25 = 250$
2. b) $213 \times (12 + 127) = 29607$ hal – tibxaaluhu waa 213, laba – tibxaaluhuna waa $12 + 127$
- t) $15(x + 1) = 15x + 15$, hal – tibxaaluhu waa 15 laba – tibxaaluhuna waa $x + 1$
- j) $2(x + y) = 2x + 2y$ hal – tibxaaluhu waa 2 laba – tibxaaluhuna waa $x + y$
- x) $(3 + 15)5x = 18 \times 5x = 90x$, hal – tibxaaluhu waa $5x$, laba – tibxaaluhuna waa $3 + 15$
- kh) $5y(11 - 7) = 5y \times 4 = 20y$, hal – tibxaaluhu waa $5y$, laba – tibxaaluhuna waa $11 - 7$
- d) $2(x - 11) = 2x - 22$, hal – tibxaaluhu waa 2, laba – tibxaaluhuna waa $x - 11$
- r) $4y(2x + 3y) = 8xy = 12y^2$, hal – tibxaaluhun waa $4y$, laba – tibxaaluhuna waa $2x + 3y$.
- s) $2x(5y - 7x) = 10xy - 14x^2$, hal – tibxaaluhu waa $2x$ laba – tibxaaluhuna waa $5y - 7x$.

Jawaabaha Layliska 2.5

1. b) $2x - 10$ t) $15x + 150$ j) $10x + 20$
x) $-12x + 15$ kh) $24x + 96$ d) $-12x + 24x^2$
2. b) $2x^2 + 2xy$ t) $15x^2 - 10xy$ j) $-8x^2y - 8x^3$
x) $-48x^2y + 84xy^2$ kh) $6x^2y^2 + 6xy^3$ d) $120x^3y^2 + 25^2x^3y^3$
r) $-6x^3y^2 + 10^3xy^3$ s) $-12x^3y + 18xy^3$
3. b) isku – mid t) isku – mid ma'aha
j) isku – mid ma'aha x) isku – mid ma'aha
kh) isku – mid d) isku – midh
r) isku – mid s) isku – mid

2.2.2 Isku – dhufashada Laba – tibxaaleyaasha

Qeyb-hoosaadyadii hore ardaydu waxay noqdeen kuwo yaqaana isku – dhufashada hal – tibxaalaha iyo laba tibxaalaha ayagoo isticmaalaya Astaanta kala – dhiga isku – dhufashada ee isu – geynta (Awa kala goynta).

Xaalado guud ahaaneed waxay ka muuqan doonaan markay Ardaydu isku – dhufanayaan laba – tibxaale, laba – tibxaale kale Halkan Ardyda us sheeg in isirada (laba tibxalle) loo tixgalin karo isir keliya, dabadeedna waxaa lagu kala dhigi karaa tibxaha ku jira qowska labaad.

Sida:- $(x + y)(z + w) = (x + y)z + (x + y)w$

Halkan laba – tibxaalaha koowaad ee $(x + y)$ waxaa loo qaadan inuu yahay oo kale hal – dhigi ama lagu dhufan wadarta tibxaha qowska ku jira. Qeybtii hore Ardaydu waxay ku soo barten sida loo Raadiyo taranta $(x + y)$ z iyo $(x + y)$ w ayadoo la isticmaalayao Astaanta kala – dhiga.

Waxa kale oo aad u qaadan kartaa qowska labadaa sidoo kale hal xubin, dabadeedna ku kala – dhig qowska koowaad $(x + y)(z + w) = x(z + w) + y(z + w)$

Labada xaaladoodba Ardaydu waa inay helaan jawaab isku mid ah ayna caddeeyaan inay tahay

Maxsuulku: $(x + y)(z + w) = xz + xw + yz + yw$

Talaabada xigtaa waa lagu layliyo Ardayda tusaaleyaal kale oo isku – dhufashada laba – tibxaaleyaasha ah, halka horgaluhu ka yahay mid kala duwan ee doorsoomeyaal kalena ay kaga jiraan.

Tusaale ahaan:

$$(3x + 5y)(2xy - x^2) = 3x(2xy - x^2) + 5y(2x - x^2) = 6x^2y = 3x^3 + 10yx - 5yx^2$$

Jawaabaha Hawlgalada 2.10

1. Bedadka qeybaha hoosaadada garaafyadu waa xy , xw , zy iyo xw
2. Wadarta bedadka qeyb – hoosaadada garaafku waa $xy + xw + zy + zw$
3. Bedka laydiga ugu weyn ee ka samaysam Afarta garaaf – hoosaad waa $(x + y)(z + w)$
4. Maadaama oo laydiga ugu weyni ka samaysmo dhammaan garaafhoosaadyada, ma jirta wax kale oo aan ahayn maxsuulka (2), dabadeed (3) waa inay la mid noqota (2).
5. Su'aasha (4) waxaan ka helay $(x + y)(z + w) = xy + xw + zy + zw$

Jawaabaha Hawlgalka 2.11

1. b) $(x + 2)(x + 3) = x^2 + 5x + 6$ t) $(x + 2)(x - 3) = x^2 - x - 6$
 j) $(x - 3)(x + 3) = x^2 - 9$ x) $(x - y)(x + y) = x^2 - y^2$
 kh) $(2x - y)(2x + 3y) = 4x^2 + 4xy - 3y^2$
 d) $5(3x + y)(2x - 3y) = 30x^2 - 35xy - 15y^2$
 r) $2(2x - 3y)^2 = 8x^2 - 24xy + 18y^2$
2. Tibix kasta oo ka mid ah qowska koowaad waa in lagu dhufto, tibix kasta oo ka mid ah qowska labaad, sida:-
 b) $(x + y + 2)(2x + 3y) = 2x^2 + 5xy + 3y^2 + 4x + 6$
 t) $(x + y + 2)(2x - y + 1) = 2x^2 + xy + 5x - y^2 - y + 2$

Jawaabaha Layliska 2.6

1. b) $x^2 - y^2$ t) $12x^2 + 6xy - 36y^2$
 j) $16x^2y = 4x^2y^2 + 12xy - 3xy^2$ x) $x^2z + x^3yz + x^2yz + x^3y^3t$
 kh) $x^2yz + xy^2z + yxz^2 + y^2z^2$ d) $x^2 + y^2 + x^3 + xy^2$
 r) $-12x^2yz - 48x^2y^2z + 10xy^2z + 20xy^3z$
 s) $6x^3y - 15x^2y^2 + 4x^2y^2 - 10xy^3$
2. b) $6x^2 + 3x - 2$ t) $8x^2 + 11x - 12$ j) $6xy - x^2 - y^2$
 x) $3x^3 + 6x^3y$ kh) $x^2 + y^2$ d) $x^2 - y^2 + x + y$
 r) $2y^2$ s) $2x^2 + 2xy + 2y^2$

Jawaabaha shaqo – kooxeeda 2.3

1. $xy + y + 2x + 2 = y(x + 1) + 2(x + 1) = (y + 2)(x + 1)$
2. $x^2 + xy + x + y = x(x + y) + 1(x + y) = (x + 1)(x + y)$
3. $ax + ay + bx + by = a(x + y) + b(x + y) = (a + b)(x + y)$
4. $x^2y + y + x^2 + 1 = y(x^2 + 1) + 1(x^2 + 1) = (y + 1)(x^2 + 1) \Rightarrow (y + 1)(x^2 + 1)$
5. $2xy + 2ax + 3y^2 + 3ay = 2x(y + a) + 3y(y + a) = (2x + 3y)(y + a)$

Qiimeyn

Ujeedada ah in aad agaamid heerkooda fahamka isku-dhufasha hal – tibxaaleyaasha iyo isku – dhufashada laba – tibxaaleyaasha, waxaad u dirir kartaa Ardyda inay ka shaqeeyaan hawlgalada, laylisyada, hal – xidhaaleyaasha iyo shaqo ay kaga shaqeeyaan guriga.

2.3 ISIR WEYNEYAASHA AY WADAAGAAN

Xiisadaha loo qoondeeyey: 10 xiisadood

Waxa laga Rabo Ardyada:-

Dhammaadka cuttub – hoosaadkan, Ardaydu waxay Awoodi doonaan inay:-

- Raadiyaa isirweynaha ay wadaagaan tibaaxaha aljebraad.
- Isireeyaan laba – tibxaaleyaasha.

Ereyo cusub

- Isir, isir ay wadaagaan, isirweynaha ay wadaagaan, jibaarka ugu sareeya.

Hordhac

Ardayda waxa laga soo qaadayaa inay yaqaanaan Isirada tirooyinka idil ayna ku soo barten Fasaladoodii hoose ee xisaabta. Waxa kale oo laga filayaa inay caddeeyaan isirada ay wadaagaan iyo isirweyneyaasha ay wadaagaan laba ama in ka badan oo tirooyin tirsiimo ah qeybtani waxay ku dabakhaysaa xisaabfal la mid ah oo ku saabsan doorsoomeyaasha iyo tibaaxa guud ee aljebraad.

Gudbinta Casharka

Waxaa laga yaabaa in aad bartid cinwaankan adigoo sawiraya isirada qaar ka mid ah tirooyinka idil. Tusaale ahaan, isirada 12 waa 1, 2, 3, 4, 6, 12, isirada sidoo kale waxaa la yidhaa qeybiyeyaasha.

Waxaan tixgelineynaa oo kaliya isirada togan ee Abyooneyaasha ah. Sida isirada tirooyinka tirsiimo ah, waad waydiin kartaa Ardayda waxay la macno tahay Isir tiro tirsiimo oo lagu siiyey. Waxa kale oo aad weydiin kartaa iyaga inay taxaan dhammaan isirada suurtoogalka ah ee 12, 24, 720 iwm dabadeedna waxaad u gudbi kartaa inaad weydiiso Ardayda inay qoraan isirada ay wadaagaan laba – tiro oo tirsiimo aan dhahno 36 iyo 24.

Waad ballaadhin kartaa ama dheerayn kartaa fikrad taa la mid ah xaalada isirada tibaaxaha Aljebraad.

Waxa kale oo aad bari kartaa fikradaha jibaarada doorsoomeyaasha x (jibaarada togan) sida tibaaxaha qaabka $1, x, x^2, x^3$ waa inaad u sheegtaa 1 yahay isir $x, x -$ na tahay isir x^2 , sidaa si la mid ayuu u kordhi jabaarka x , ka soo horjeedku ma'aha run, tusaale ahaan x^2 ma'aha isirka x .

Hadda aan tixgalino xaalada tibaaxda leh hal ama in ka badan oo doorsoomeyaal ah aan dhahno x^2y isiradu waa $1, x, x^2, y, xy, x^2y$ jibaarka x ee isirka dhexdiisu waa inaanu dhaafi jibaarka x ku jirta tibaaxda.

Jibaarka y ee isirka dhexdiisu waa inaanu dhaafin ama ka badan jibaarka y ku jirta tibaaxda.

Baruhu sidoo kale waa inuu baraa habka lagu isireeyo tibaaxaha saableyda ee qaabka:-

$$x^2 + (a + b)x + ab = (x + a)(x + b), \text{ halka } a \text{ iyo } b \text{ ka yihiin abyooneyaal}$$

- $x^2 + 2xy + y^2 = (x + y)^2$
- $x^2 - 2xy + y^2 = (x - y)^2$
- $x^2 - y^2 = (x - y)(x + y)$

Baruhu waa inuu Baraa Ardayda xeer – xisaabeedka saxda ah ee ku haboon kana caawin Isiraynta sidii isugeynta iyo kala goynta tibxaha isu midka ah. Waxa kale oo aad diyaarin kartaa shax leh midabo taasoo laga yaabo inay caawiso xusuusta Ardayda ee isiraynta xagga sare.

Fududeynta tibaaxaha lakab ee

Aljebraad; sida:- tibaaxda Aljebraad taasoo ah qeyb laba tibxaaleyaal (waxay yeelan kartaa Doorsoomeyaal kale)

Waxad ka caawisaa marka hore inay isireeyaan sare yaha dabadeedna hooseeyaha, dabadeedna baabii isirada ay wadaagaan sareeyaha iyo hooseeyuhu.

Jawaabaha hawlgalka 2.12

1. haa, x waa isirka x^2
2. maya, x^2 isir uma aha x
3. dhammaan isirada x^3 waa $1, x, x^2, x^3$
4. b) 0 isirada x^2y waa $1, x, x^2, y, xy, x^2y$
 t) isirada xy^2 waa $1, x, y, y^2, xy, xy^2$
 j) isirada ay wadaagaan x^2y iyo xy^2
 waa $1, x, y$ iyo xy
 x) Isirka ugu weyn ee ay wadaagaan x^2y iyo xy^2 waa xy .

Jawaabaha Hawlgalka 2.13

- b) isirada ay wadaagaan $6ab$ iyo $8a^2$ waa $1, 2, a$, dabadeed isirka u weyne ee ay wadaagaan $6ab$ iyo $8a^2$ waa $2a$.
- t) Isirka ay wadaagaan $9a^2b$ iyo $45a^2b^3$ waa $1, 3, 9, a, a^2, 3a, 3a^2, 9a, 9a^2, b, 3b, 9b, ab, 3ab, 9ab, a^2b, 3a^2b, 9a^2b$
 Dabadeed isirka ugu weyn ee ay wadaagaan $9a^2b$ iyo $45a^2b^3$ waa $9a^2b$
- j) Isirka ay wadaagaan $15a^3b^2$ iyo $45a^2b^3$ waa:- $1, 3, 5, 15, a, a^2, 3a, 5a, 15a, 3a^2, 5a^2, 15a^2, ab, 3ab, 5ab, 15ab, ab^2, 3ab^2, 5ab^2, 15ab^2, a^2b, 3a^2b, 5a^2b, 15a^2b, a^2b^2, 3a^2b^2, 5a^2b^2, 15a^2b^2$
 Dabadeed Isirka ugu weyn ee ay wadaagaan $15a^3b^2$ iyo $45a^2b^3$ waa $15a^2b^2$
- x) Kuwan soo socda si la mid ah ayaad ku heli kartaa Isirka ay wadaagaan $8x^2y^3z^3$ iyo $16xy^2z$ in uu yahay $8xy^2z$.

Jawaabaha Layliska 2.7

1. b) $7x + 4$ t) $10(2x - 1)$
 j) $3y(6x - z)$ x) $6m(2n + 3p)$
 kh) $4m(m - 1)$ d) $3(x^2 + 2x - 6)$
 r) $-6(x + 4)$ s) $-2x(y + 4)$
 sh) $8mn(3 - 2m)$ dh) $-xy(x + y)$
 c) $12m^2n(1 + 2n)$ g) $18y^2p(4 - p)$

2. b) $(x+3)(4+m)$ t) $(x-1)(x+5)$
 j) $(y+4)(y-6)$ x) $x(x+7)(x+1)$
 kh) $(x-4)(3x-7)$

Jawaabaha Layliska 2.8

1. 1, 2, 3, 6, 9, 18
 2. b. 1, 2, 4, 8 t. 1, 2, t , $2t$ j. 1, 2, 4, 8, 16
 3. b. 1, 2, 4, x , $2x$, $4x$
 t. 1, x , x^2
 j. 1, 3, x , $3x$, x^2 , $3x^2$
 x. 1, 5, x , $5x$, xy , $5xy$, y , $5y$, y^2 , $5y^2$, $5xy^2$
 kh. 1, y , y^2 , y^3
 d. 1, 3, x , $3y$, xy , $5xy$, x , $5x$, x^2 , $5x^2$, $5yx^2$
 r. 1, x , y , z , xy , xz , yz , xyz
 s. 1, x , y , z , xy , xz , yz , xyz , z^2 , xz^2 , yz^2 , xyz^2
 4. b. $-3(x-7)$ t. $3x(2x+1)$
 j. $6x(3x+2y)$ x. $6m(t-4m)$
 kh. $9(2x+3y)$ d. $(x+3)(x-7)$
 5. i. isirka ay wadaagaan
 b. 1, x , x^2 t. 1, x , x^2
 j. ± 1 , ± 2 , ± 3 , ± 6 , $\pm xy$, $\pm 2xy$, $\pm 3xy$, $\pm 6xy$
 $\pm x^2y$, $\pm 3x^2y$, $\pm 6x^2y$, $\pm xy^2$, $\pm 2xy^2$, $\pm 3xy^2$, $\pm 6xy^2$
 x. 1, 2, x , $2x$, y , $2y$, x^2 , $2x^2$, xy , $2xy$, xy^2 , $2xy^2$, x^2y , $2x^2y$,
 x^2y^2 , $2x^2y^2$
 kh. 1, x
 d. 2, x , y , $2x$, $2y$, $2xy$ r. x^2 , y , $3x$, $3xy$, $3x^2y$, $3z$, $3x^2z$, $3x^2yz$
 ii. isir weynaha ay wadaagaan
 b. x^2 t. x^2 j. $6x^2y^2$ x. $2x^2y^2$ kh. x
 d. $2xy$ r. $3x^2yz$
 6. b. $\frac{x}{5}$ t. $\frac{x+5}{2}$ j. x x. $\frac{x+3}{x+2}$
 kh. $\frac{3(x-5)}{8}$ d. $\frac{4}{3}$ r. $\frac{xy+3x}{2}$
 s. 2 sh. $\frac{35mn}{48x+24}$

Qiimeyn

Ayadoo ka ah qeyb habka qiimeynta joogtada ah, waxaa lagugula taliyey si aad ugu fududayso doodaha sii shaqoguri, shaqo fasal iyo hawlgalo ku saabsan raadinta isir weynaha ay wadaagaan (I.w.w) ee tibaaxaha aljebraad.

Jawaabaha layliska nakhtiinka ah ee cuttubka 2^{aad}

1. b) saddex, x, y, z t) hal, x j) hal, $\sqrt{1+x+y+z}$
2. b) i) $2x + 3x + 5x = (2x + 3x) + 5x$
 $= 5x + 5x = 10x$
 ii) $2x + 3x + 5x = 2x + (3x + 5x)$
 $2x + 8x = 10x$
 t) i) $-3y + 13y - 4y = (-3y + 13y) - 4y = 10y - 4y = 6y$
 ii) $-3y + 13y - 4y = -3y + (13y - 4y)$
 $= -3y + 9y = 6y$
3. b) $x + 2y + 5x = x + 5x + 2y$ t) $5y + 7x - 3y$
 $= (x + 5x) + 2y$ $= 5y - 3y + 7x$
 $6x + 2y$ $(5y - 3y) + 7x$
 $2y + 7x$
 j) $8x + 2y - 20x = 8x - 20x + 2y$
 $= (8x - 20x) + 2y = (8x - 20x) + 2y$
 $-12x + 2y$
 x) $2x + 3y - 5x - 8y = 2x - 5x + 3y - 8y$
 $= (2x - 5x) + (3y - 8y) = -3x - 5y$
 Kh) $yx^2 - xy + 7x^2y = (x^2y + 7x^2y) - xy = 8x^2y - xy$
 d) $xy + 7xy^2 - 12xy = (xy - 12xy) + 7xy^2 = -11xy + 7xy^2$
4. b) $x \times y = xy$ t) $x \times y \times z = xyz$
 j) $3 \times x = 3x$ x) $x \times x = x^2$
 kh) $y \times y \times y = y^3$
5. b) $2x \times 3y = 6xy$ t) $-3x \times 7y = -21xy$
 j) $-2x \times 4x = -8x^2$ x) $-3x \times -5x = 15x^2$
 kh) $2y \times 3y \times 7y = 42y^3$ d) $2x \times 3y \times 6x = 36x^2y$ waa dheeri (extra)
6. b) $x + 2x = 3x$
 t) $x + 2x + 3x = (x + 2x) + 3x$ ama $x + (2x + 3x)$
 $= 6x$ $x + 5x$
 $= 6x$
 j) $x^2 - 5x^2 + 7x^2 = (x^2 - 5x^2) + 7x^2$
 $= -4x^2 + 7x^2$ ama $x^2 - (5x^2 - 7x^2)$
 $= 3x^2$ $= x^2 + 2x^2$
 $= 3x^2$

$$x) \quad 2xy - 8xy = -6xy$$

$$kh) \quad 8xy^3z^3 + 12xy^2z^3 - 5xy^2z^3 = 8xy^3z^3 + 7xy^2z^3$$

$$d) \quad x^2 + 12x^2 - 3x^2 (x^2 + 12x^2) - 3x^2 \\ = 13x^2 - 3x^2 \quad \text{ama} = x^2 + 9x^2 \\ = 10x^2 \qquad \qquad \qquad = 10x^2$$

7. Aan ka soo qaadno tirada koowaad x , dabadeedna,

Tirada labad waa $x + 1$

Ta saddexaadna waa $x + 1 + 1 = x + 2$

Ta afraadna waa $x + 1 + 1 + 1 = x + 3$

Ta shanaadna waa $x + 1 + 1 + 1 = x + 4$

Wadarta tibxaha sare waa

$$x + x + 1 + x + 2 + x + 3 + x + 4 = 35$$

$$5x + 10 = 35$$

$$5x = 35 - 10$$

$$5x = 25$$

$$x = 5$$

sidaas darteed, abyoonaaha ugu gari waa 5.

8. Adigoo isticmaalaya qaaciidada

$$C = \frac{5}{9}(F - 32F^\circ) = \frac{5}{9}(50^\circ - 32^\circ) = \frac{5}{9}(18^\circ) = 10^\circ$$

9. Siin, $\ell = 2w$, $p = 30$ sm

$$P = 2(\ell + w)$$

$$30 \text{ sm} = 2(2w + w)$$

$$30 \text{ sm} = 6w$$

$$\text{Hadaba, } w = \frac{305 \text{ m}}{6} = 5 \text{ sm}$$

I, si aan u helo, waxaan ognahay in $\ell = 2w$

$$\ell = 2(5 \text{ sm})$$

$$\ell = 10 \text{ sm}$$

Bedka laydigu waa $A = \ell \times w$

$$= 10 \text{ sm} \times 5 \text{ sm}$$

$$A = 50 \text{ sm}^2$$

Sidaas darteed bedka laydigu waa 50 sm^2

10. Jibbaarka ugu sareeya ee x , taasoo ah isirka ay wadaagaan $24x^2y^3$ iyo $60x^3y^2z^2$ waa x^2 , jibaarka ugu sareeya ee y , taasoo ah isirka ay wadaagaan $24x^2y^3$ iyo $60x^3y^2z^2$ waa y^2 , jibaarka ugu sareeya ee z , taasoo ah isirka ay wadaagaan $24x^2y^3$ iyo $60x^3y^2z^2$ waa 1 , tirooyinka horgaleyaasah ahi waa 24 iyo 60 isirka ay wadaagaana waa 12 , sidaas darteed, I.w.w of $24x^2y^3$ iyo $60x^3y^2z^3$ waa $12x^2y^2$.

CUTUBKA ISLE'EGTA TOOSAN IYO DHEELIYADA

HORDHAC

Cutubkani waxa uu ka kooban yahay saddex qaybood qaybta koobaad waxay kahad laysaa hanaanka qaab badalista isle'egta ee isle'egta toosan si looxaliyo isle'egtaas qaybta labaad waxay faahfaahinaysaa farsamooyinka xallinta isle'egta toosan dheelida toosan. Qaybta saddexaad waxay kahadlaysaa habdhiska kulannada kaartiska, isle'egta iyo garaafyada xariiqyada toosan.

Natiijooyinka Cutubka

Ardayda markay cutub kan dhameeyaan waxay awoodidoonaan inay:-

- *fahmaan fikradaha isle'egta iyo dheeliga*
- *kobciyaan xirfaddooda ay kuhabaynayaan kuna xallinayaan isleegta toosan iyo dheeliga toosan.*
- *isticmaalaan xeerarka isudhigan ka qaab badaleed ee isle'egta iyo dheeliga ee xallinta waydiimaha*
- *sawiraan xariiqda ka gudubka aas aaska isle'egta larabo*

Talooyinka hanaanka barista

Buugaagta ardayda kasokow waxaa wanaagsan inaad isticmaashid miisaan leh kafad midig iyo bidix, qaabkani aad ayuu waxtar u leeyahay si loo sharaxo (sax ahaan) isudhiganka qaab badaleed ee isle'egta iyo dheeliga.

3.1 FAAHFAAHINTA ISLE'EGTA TOOSAN

Xiisadaha loogutalogalay: 10 xiisadood

Waxa Ardyga laga rabo

Dhammaadka cutub hoosaad ka ardaydu waxay awwoodidoonaa inay

- *xalliyaan isle'egta toosan ee leh baraaheedada iyadoo isticmaalaya isudhiganka qaab badaleed*
- *xalliyaan isle'egta toosan ee jajabka.*
- *xalliyaan eray xidhmeeda saxda ah iyadoo isticmaalaya isle'egta toosan*

Hordhac

Cutub hoosaadkani wuxuu matalayaa fikradaha xallinta isle'egta toosan. Xisaabta isle'egta nooca ugu fududid: waa isla'egta toosan iyo hanaan ka loo fur furo, sikastaba ha ahaatee hannaanka furfuriseed ee isle'egta toosan ayaa waxay yihiin kuwu laisticmaalo badi xisaabta ee heerka dhexe iyo kasare, sidaas darteed haday ardaydu sifiican ubartaan fikradaha iyo hababka lagu xusay cutub hoosaadkaa.

Tilmaamaha waxbarista

Bilaw cutubka adigoo kacawinaya ardayda inay muraajaceeyaan furfurista isle'egta toosan iyadoo isticmaal ayaa iskudhiganka qaab badaleed, Tijaabada shaqo koxeedka 3.1 waxaa looga adkaynayaa ujeedadaas shaqo-kooxeedka waxaa lagutilmaamay qaabka su'aalaha iyo jawanbaha sidaas darteed. Ardaydaada kala shaqee kana caawi inay kudheelaana in ayka lashaqayaan geemka lagu xusay daabaca, billawga hore waxaa lagaarabaa inaad maamusho dheeliga sidaas ayay ardaydu kufahmayaan xeerka ciyaarta markay fahmaan xeerarka dheeliga ah u'ogolaw inay koox ahaan tooda uciyaaraan gaymku wuxuu ardayda u'awoodsiinayaa inay sifirfircoon ay uisticmaalaan fikradda guud ee isudhiganka qaab bedelka isleegta gaymka kadib, ardayda kacaawi inay ogaadaan in su'aalaha laguxusay geemku ay noqon karto mid sirasmi dheeligalooqutibaaxay isle'eg toosan intaas waxaa dheer ardayda waxaad waydiisaa inay taxaan farsamooyinka ay isticmaaleen si ay ugartaa su'aalaha lagu xusay geemka.

Furfurista Shaqo kooxeedka 3.1

- | | | | |
|-------|-------------------------------------|----|--------------------------|
| 1. b. | 10, ilaa $10 + 5 = 14$ | t. | 8, ilaa $8 - 3 = 5$ |
| | j. 6, ilaa $3 \times 6 = 18$ | x. | 12, ilaa $12 \div 2 = 6$ |
| | kh. 3, ilaa $(2 \times 3) + 5 = 11$ | | |

Hawlgalka 3.2 xoogananta fikirka guud ee ardayda, ee xeerka isku dhigaanta isbedelada eray ka ogaadaan shaqo, kooxeedka kore, howlgalka fasalka dhexdiisa wuxuu ka gargaaray ardaydaada in ay indho indheyaan waxisbedel ahi ka sameysmey hal dhinac oo dheelitirka ahi oo ay tahay in uu dhameystirmo isle’ekaanshaha tafada ee dhinac kale si loo ilaaliyo ka dheeli tirka miisaanka. Tani waxay awood ka siineysaa ardayda in ay ogaadaan xidhiidhka u dhexeeya isku dhignaanta isle’egyada iyo dheelitirka miisaan ka marxaladan, ardaydu waxay diyaar u tahayayi inay fahmaan afarta xeer ee isku dhignaanta isbedalka cad xeerka kowaad. I, ilaa xeerka 4.

Cutub hoosaadka buuga ardayga, xeererkan waxaa ka dhaxleysaan qaybaha aasaasiga ah iyo ka koobnaashaheeda ee tabaha xalinta ee dhaamaan isle’egyada heer kasta natiijo ahaan aqoonta xeerarkan aad ayay ardeyda u caawineysa ardayda ugu caawiyaan shaqooyinka xisaabta ee mustaqbalka sidaas darteed, u adeegso tusaalleyaal fara badan iyo laylisyo suurtoogalku ah si loo hubiyo in dhamaan ardaydu fahas tahay oo ay awooda adeegsigooda si ay u xaliyaan isle’egyada toosan.

Jawaabaha hawl galka 3.1

1. Hadii 2 kg lagudaro kafada ka midigta markaa kadib in lamid ah oo ah 2 kg kafada bidix miisaan ka wuxuu noqonayaa mid dheli tiran, kaas waxaa lamid ah hadii 3 kg laga qaado kafada midigta, xadi la mid ah, oo ah 3 kg waan laga qaado kafada bidix saasderteed miisaanku wuxuu noqonay aa mid dheelli tiran.
2. Jawaabta (2) waxay la mid tahay ta (1).

3.1.1 Xalinta isle’ egyada leh bilaha (qowska)

Sidaad ogtahay bilaha badanasa ka muuqdo isle,egyada waxay tilmaaman hormogalin hawlaha sida bilaha waxay caadi ahaanba idin waxyaabaha wareeriya ardayda marku ay xadinaga bilaha, hadaba si ay ardaydu awood ugu yeeshan ka bixinta wareerka, si cad ugu sharax ardayda qaarka ay ku jiraan biluhu (qowska) tibaaxaha xisaabta kana caawi iyaga si ay u awoodan kasaaridi bilaha iyagoo adeegsanaya astaamaha ku haboon masalooyinka sida astaanta kale horminta ee isugeynta iyo isku dhufashada, iyo astaanta iskadhufashada ee isugeynta. Hawlgalka **fasalka 3.3** waxay ardayda ka caawineysaa si ay ugu dhawaaqaan kuna tababartaan astaamaha maaselooyin ka.

Jawaabaha Hewlgalka 3.2

1. b. Astaanta kala hormarinta ee isugaynta: $a + b = b + a$
 Astaanta kela hormorinta isku dhufashada : $a \times b = b \times a$
- t. Kala goynta ku oodna astaanta kala hormorin taas waa,
 $a - a - b \neq b - a$. sidaas awgeed hadii $a = 1$, iyo $b = 2$, markaa
 $a - b = 1 - 2 = -1$ lakin $b - a = 2 - 1 = 1$.
 Sidaas darteed, $1 - 2 \neq 2 - 1$.
 Taas waxaa la mid ah, $a \div b \neq b \div a$. sidaas awgeed $a = 1$ iyo $b = 2$.
2. b. Astaanta hormo galinta ee isugeynta
 $a + (b + c) = (a + b) + c$ iskudhufashada: $a(bc) = (ab)c$
- t. Madaam $-2 - 5 = -7$, waxaan heleynaa $-2 - 5 - 3 = -7 - 3 = -10$.
 Dhinaca kale, $5 - 3 = 2$, $-2 - (5 - 3) = -2 - 2 = -4$.
 Sidaas derteed, $-2 - 5 - 3 \neq -2 - (5 - 3)$.
 Taas waxaa lamid ah, maadaama $2 - 5 = -1$, $(2 - 5) + 3 = -1 + 3 = 2$.
 Lakin, maadaama $5 + 3 = 8$, $3 - (5 + 3) = 3 - 8 = -5$
 Sidaas darteed, $(2 - 5) + 3 \neq 3 - (5 + 3)$
3. Astaanta kale dhgida ee isku dhufashada ee isugeynta:
 $a(b + c) = ab + ac$.

Waxaa intaas dheer, adigoo adeegsanaya dhowr tusaallooyin falanqeeya xeerkan soo socda si looga saaro bilaha (gowska).

$$a - (b + c) = a - b - c$$

$$a - (b - c) = a - b + c$$

$$a + k(b - c) = a + kb - kc$$

Ka caawi ardaydaada si ay u ogaadaan in xeerka kor kuxusan ee sida tooska ula socda astaanta kaladhiga ee iskudhufashada ka sareysa ee isugeynta iyo astaanta hormo gelinta ee isugeynta, markaa kadib ku dhiiri gali ardaydaada sidii ay u adeegsan lahaayeen xeererka kore astaanta kale ee lamidka ah masalooyinka si ay uga saran billaha una xaliyaan isle, egyada toosan.

Jawaabaha layliska 3.1

1. i. $-(b - c) = -1(b + (-1)c)$ (Xeerarrka kala goyn)
 $= -1(b) + (-1)(-1)c$ (astaanta kala dhiga)
 $= -b + c$ (maadama $-1(b) = -b$ iyo $(-1)(-1) = 1$)

$$\begin{aligned} \text{ii. } -(b + c) &= -1(b + c) \\ &= -1(b) + (-1)c && \text{(kala dhiga)} \\ &= -b - c \end{aligned}$$

$$\begin{aligned} \text{iii. } a(b - c) &= a(b + (-1)c) \\ &= ab + a(-1)c && \text{(kaladhiga)} \\ &= ab + (-1)ac && \text{(a(-1) = (-1) a)} \\ &= ab - ac. \end{aligned}$$

$$\begin{aligned} 2. \quad \text{i) } 1 - 3x &= 5 \\ -3x &= 4 \\ x &= \frac{-4}{3} \end{aligned}$$

$$\begin{aligned} \text{ii) } 2x + 3 &= -4x - 9 \\ 2x + 4x &= -9 - 3 \\ 6x &= -12 \\ x &= -2 \end{aligned}$$

$$\begin{aligned} \text{iii) } 4x - (6 + x) &= 3(2 - x) \\ 4x - 6 - x &= 6 - 3x \\ 3x - 6 &= 6 - 3x \\ 3x + 3x &= 6 + 6 \\ 6x &= 12 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} \text{iv) } 2x - 3(1 - 4x) &= 4x + 2 \\ 2x - 3 + 12x &= 4x + 2 \\ 14x - 3 &= 4x + 2 \\ 14x - 4x &= 2 + 3 \\ 10x &= 5 \\ x &= \frac{1}{2} \end{aligned}$$

$$\begin{aligned} \text{v) } \text{Sidoo kale} \\ 6x + 3(4 - 2x) &= 0 \\ 6x + 12 - 6 &= 0 \\ 0 &= -12 \\ \therefore \text{U.R} &= \{\} \end{aligned}$$

$$\begin{aligned} \text{vi) } 4x - 2(3 - x) &= 6(x - 1) \\ 4x - 6 + 2x &= 6x - 6 \\ 6x - 6 &= 6x - 6 \\ \Rightarrow 0 &= 0, \text{ Taasoo run ku ah } x \\ &\text{dhamaanteed.} \end{aligned}$$

∴ U.R = \mathbb{Q} = Ururka dhamaan tirooyinka lakab.

3.1.2 Furfurista Isle’egyo Toosan oo Jajabyo Leh

Hababka fur furiseed ee looga baahan yahay cutub hoosaadkan waxay lamid yihiin kuwa lagada hadlay cutub hoosaadkii hore marka laga reebo soo noqodka jajabyada

sidii horgalayaasha ama tibixda joogtada ah ee isle'egyada toosan. Si looga dhigo shaqada mid sahlan (fudud), ku bilow cashirka muraajaco afarta xisaabfal oo uu jajibku kushaqaynayo **wax qabada 3.5** caawinta ardayda si ay usameeyaa naqtiinka (muraajaco) hawl qabad ka fasalka dhexdisa ukuur galka ardayda adigoo u eegaya awoodooda isticmaal afarta xisaabfal ee jajibka kushaqaynayo iyadoo laga duulay ukuurgalid kudadaal ilaa heerkii aad ubaahan tahay si aad kor ugu sii qaado sharaxaadaada, kashaqayntaada jajabeed ilaa ardaydaadu fahan buuxa ay kaqaadanayaan ka shaqayntan xisaab ahaaneed. Adoo raacaya tilmaamtan kacaawi ardayda inay sameeyaan (kashaqeeyaan) inay fur furaaan isle'egta toosan ee ka kooban jajibka horgale ee doorsoome sida ku xusay buuga ardayga.

Jawaabaha Hawlgalka 3.3

1. b. $\frac{2}{5} + \frac{3}{5} = \frac{2+3}{5} = \frac{5}{5} = 1$ t. $\frac{4}{7} - \frac{1}{7} = \frac{4-1}{7} = \frac{3}{7}$
- j. $\frac{2}{9} + \frac{5}{9} - \frac{1}{9} = \frac{2+5-1}{9} = \frac{6}{9} = \frac{2}{3}$
2. (i) b. Dh.Y.W (2, 5) = 10
t. Maadaama $4 = 2^2$
 $6 = 2 \times 3$
iyo $3 = 3$
Dh.Y.W (4, 6, 3) = $2^2 \times 3 = 12$.
- j. Maadaama $12 = 2^2 \times 3$
iyo $18 = 2 \times 3^2$,
Dh.Y.W (12, 18) = $2^2 \times 3^2 = 36$
- (ii) b. Maadaama Dh.Y.W (2, 5) = 10, waxaan helaynaa
 $\frac{1}{2} + \frac{3}{5} = \frac{2(5)+3(2)}{10} = \frac{16}{10} = \frac{8}{5}$
- t. $\frac{1}{2} - \frac{3}{5} = \frac{2(5)-3(2)}{10} = \frac{10-6}{10} = \frac{4}{10} = \frac{2}{5}$
- j. Maadaama Dh.Y.W (12, 18) = 36, waxaan helaynaa
 $\frac{-1}{12} + \frac{5}{18} = \frac{-1(3)+2(5)}{36} = \frac{-3+10}{36} = \frac{7}{36}$
- x. Maadaama Dh.Y.W (4, 6, 3) = 12, waxaan helaynaa
 $\frac{1}{4} + \frac{5}{6} - \frac{2}{3} = \frac{3(1)+2(5)-2(4)}{12} = \frac{3+10-8}{12} = \frac{5}{12}$

3. Xasuuso in $\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$. Sidaasi darteed

$$b. \quad \frac{2}{3} \times \frac{3}{2} = \frac{\cancel{2} \times \cancel{3}}{\cancel{3} \times \cancel{2}} = \frac{1}{1} = 1 \quad t. \quad \frac{-3}{2} \times \frac{5}{4} = \frac{-3 \times 5}{2 \times 4} = \frac{-15}{8}$$

$$j. \quad \frac{1}{2} \times \frac{3}{3} \times \frac{4}{6} = \frac{1}{2} \times \frac{4}{6} = \frac{1 \times 4}{2 \times 6} = \frac{4}{12} = \frac{1}{3}$$

4. b. $m = \text{Dh.Y.W}(4, 6, 3) \Rightarrow m = 12$. Sidaa darteed

$$b. \quad \frac{3}{4} m = \frac{3}{4} \times 12 = \frac{3 \times 12}{4} = \frac{3 \times 3}{1} = 9$$

$$t. \quad \frac{-5}{6} m = \frac{-5}{6} \times 12 = \frac{-5 \times 12}{6} = -10$$

$$j. \quad \frac{2}{3} m = \frac{2}{3} \times 12 = \frac{2 \times 12}{3} = 8$$

t. Kudhufo labada dhinacba.

$$\frac{1}{4}x + \frac{2}{3} = \frac{1}{6} \quad \text{min } m = 12, \text{ waxaan helaynaa}$$

$$12 \left(\frac{1}{4}x + \frac{2}{3} \right) = 12 \times \frac{1}{6}$$

$$\Rightarrow \frac{12}{4}x + \frac{12 \times 2}{3} = \frac{12 \times 1}{6}$$

$$\Rightarrow 3x + 8 = 2$$

Taasi oo ah iskudhufashada Dh.Y.W hooseeye yaasha

Jawaabaha Layliska 3.2

1. $\frac{1}{2}x - \frac{3}{4} = 0$ Kudhufo labada dhinacba Dh.Y.W (2, 4) = 4.

$$\Rightarrow 4 \left(\frac{1}{2}x - \frac{3}{4} \right) = 4 \times 0 \Rightarrow 2x - 3 = 0 \Rightarrow 2x = 3 \Rightarrow x = \frac{3}{2}$$

2. $\frac{x}{4} - \frac{x-3}{6} = 1$ KUDhufo labada dhinac Dh.Y.W (4, 6) = 12

$$\Rightarrow 12 \left(\frac{x}{4} - \frac{x-3}{6} \right) = 12 \times 1$$

$$\Rightarrow \frac{12}{4}x - \frac{12}{6}(x-3) = 12$$

$$\Rightarrow 3x - 2(x-3) = 12$$

$$\Rightarrow 3x - 2x + 6 = 12$$

$$\Rightarrow x + 6 = 12$$

$$\Rightarrow x = 12 - 6$$

$$\Rightarrow x = 6$$

3. $\frac{2x-1}{3} + \frac{3x+2}{8} = \frac{23}{24}$; Dh.Y.W (3, 8, 24) = 24
 $\Rightarrow 24 \left(\frac{2x-1}{3} + \frac{3x+2}{8} \right) = 24 \left(\frac{23}{24} \right)$
 $\Rightarrow 8(2x-1) + 3(3x+2) = 23$
 $\Rightarrow 16x - 8 + 9x + 6 = 23$
 $\Rightarrow 25x - 2 = 23$
 $\Rightarrow 25x = 23 + 2$
 $\Rightarrow 25x = 25$
 $\Rightarrow x = 1$
4. $\frac{x+2}{9} - \frac{1}{3} = \frac{1-x}{3}$ Dh.Y.W (9, 3, 3) = 9
 $\Rightarrow 9 \left(\frac{x+2}{9} - \frac{1}{3} \right) = 9 \left(\frac{1-x}{3} \right) \Rightarrow (x+2) - 3 = 1-x$
 $\Rightarrow x - 1 = 1 - x \Rightarrow 2x = 2$
 $\Rightarrow x = 1$
5. $\frac{1}{2}(9-x) + \frac{1}{3}(2x+7) = \frac{5}{2}$ Dh.Y.W (2, 3, 2) = 6
 $\Rightarrow 6 \left[\frac{1}{2}(9-x) + \frac{1}{3}(2x+7) \right] = 6 \left(\frac{5}{2} \right)$
 $\Rightarrow 3(9-x) + 2(2x+7) = 3(5)$
 $\Rightarrow 27 - 3x + 4x + 14 = 15$
 $\Rightarrow x + 41 = 15 \Rightarrow x = 15 - 41 = -26$

3.1.3 Adeegsiga Furfurista Masalooyin ka Isle'egta Toosan

- Ka caawi ardayda inay dhamaan tood kudhaqaaqaan (sameeyaan) tadaabooyinka hoose ay furfuran masalooyinka adeegsiga isle'egta toosan.
 1. Fah mida (garasho) masalo
 2. Dhamaan liiska tirooyinka aan lagaranayn ee adeegsiga masalooyinka doorsoome, (dheh, $x, y, z, i.w.m.$)
 3. Adeegsiga doorsoomayaasha aasaaska isle'egta taasoo ah ka baaraan degida xidhii dhka ka dhexeeya tirooyinka la siiyay iyo kuwa lawaydiiyay ardayda.
 4. Xalinta ama kashaqaynta isle'egta.
 5. Hubinta Natijada.
 6. Jawaab ka bixinta macquulka ah ee su'aasha.
- Ku dhiirgalinta ardayda si ay usameeyaan karaan erayga fur furista isle'egta ee la soo darista nolol maalmeedka macnaha si ay ugashaqayn karaan.

Fur Furista ama (xalka) Hawlgalka 3.4

1. Ogow x Haday utaagan tahay tiro jirta markaa kadib labooduba waxay noqon karaan jiro oyin jira (lahubo) $= 2x$, iyo shan waxayka badan $2x = 5 + 2x$. Tani oo noqonaysa 21 maadaa ma fur furista isle’egtani tahay.

$$5 + 2x = 21 \Rightarrow 2x = 16 \Rightarrow x = 8$$

Sidaa darteed jawaabta tirada waa 8.

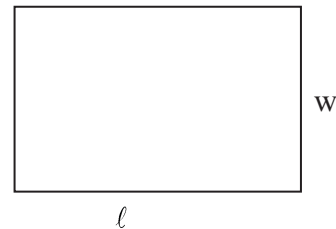
2. Ogow in ℓ ay tahay dhererka laydi “W” aytahay ballaca.

Markaas ballacu haduu 3 kayar yahay

dhererka taasmacnaheedu waa

$$W = \ell - 3$$

Hadii wareegu $= 2\ell + 2w$ wuxuu noqon lahaa 20 sm.



Taasoo ah $2\ell + 2w = 20 \Rightarrow 2(\ell + w) = 20 \Rightarrow \ell + w = 10$

$$\Rightarrow \ell + (\ell - 3) = 10 \quad (\text{Isticmaal } w = \ell - 3)$$

$$\Rightarrow 2\ell - 3 = 10 \Rightarrow 2\ell = 13 \Rightarrow \ell = \frac{13}{2}$$

$$\text{Imika, } w = \ell - 3 \Rightarrow w = \frac{13}{2} - 3 = \frac{13 - 2(3)}{2} = \frac{7}{2}$$

Maadaama dhererku yahay $\frac{13}{2}$ cm iyo balacuna yahay $\frac{7}{2}$ sm.

3. Fur fur oo ka shaqee buuga daabaca buuga ardayga (eeg tusaalaha 4, qormada 3.1.3).

Jawaabaha Layliska 3.3

1. Ogow x haday noqoto tiro aan lagaranayn markaas waxaan ufasiraynaa (udhigi karnaa).

$$12 + 3x = 0$$

$$3x = -12$$

$$x = -4$$

Markaa Tiradaasi waa -4 .

2. Ogow x = cabir qiyaaseed dhulka marka ugu horaysa lacarro roggay (laqoday).

y = cabir qiyaaseedka dhulka marka labaad lacarro rogay.

z = Cabir qiyaaseedka dhulka marka saddexaad laqoday.

Dhulka laqoday dhamaan tiina yahay 8.4 HKT taasoo ah.

$$x + y + z = 8.4 \text{ Hektaris} \dots\dots\dots (1)$$

Dhulka marka labaadka laqoday 0.8 hika ayuu kabadnaa kiimarkii ugu horaysay laqoday taasoo ah,

$$y = 0.8 + x \dots\dots\dots(2)$$

Kadhig qiimaha y halka (1), aan helnay oo noqon sidan

$$x + (0.8 + x) + z = 8.4$$

$$\Rightarrow 2x + 0.8 + z = 8.4 \dots\dots\dots(3)$$

Kabacdi carro roga (qodaalka) saddexaad 0.5 hektar ayuu kabadnaa ka labaad taasoo noqaysa.

$$z = 0.5 + y$$

$$\Rightarrow z = 0.5 + (0.8 + x) \quad (\text{Uqaado in } y = 0.8 + x \text{ halkii (2)})$$

$$\Rightarrow z = 1.3 + x \dots\dots\dots (4)$$

Habdaba uqaad qiimihii z halka isle'egta z (3), waxaan helaynaa

$$2x + 0.8 + (1.3 + x) = 8.4$$

$$\Rightarrow 3x + 2.1 = 8.4$$

$$\Rightarrow 3x = 8.4 - 2.1 = 6.3 = \frac{63}{10}$$

$$\Rightarrow x = \frac{1}{3} \times \frac{63}{10} = \frac{21}{10} = 2.1$$

Hadana in aad ugashaqayso halkii (2) iyo (3) waxaan helaynaa

$$y = 0.8 + 2.1 = 2.9, \text{ iyo}$$

$$z = 1.3 + 2.1 = 3.4$$

Sidaa darteed markii koobaad waxaa laqoday 2.1 hi

Qodaalka markii labaadna 2.9 ha, iyo

Qodaalka markii saddexaad 3.4 ha.

3. Maskaxda kuhay Qiimaha kharashka ganacsaduhu uu Bixiyay si uu uhelo dallado ayaa ah $3,250 + 25 = 3,275$.

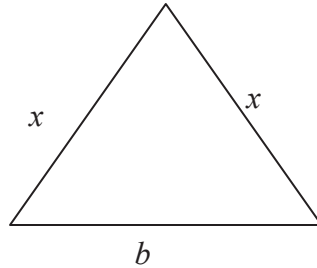
Hadii aan ukala qaadno tiro dhan 50 dalladood wax aynu heli

$$3,275 \div 50 = 65.5$$

Maadaama qiimaha kharashka kubaxay dalladaha uu yahay Birr 65.50 m

Sidaas darteed hadii faa iidada dallad kasta looga baahan yahay ay tahay Birr 2.50, markaa kadib giimaha iibkaa waa in uu le, ekaado
 Birr $65.50 + 2.50 = \text{Birr } 68.00$.

4. Labada dhinac ee sadexagal labaale wey isleegyihin sidaas awgeed kasoo qaad dhinacyada bedka x ; iyo kasoo qaad in uu dhererka utaagan yahay salka sidaas derteed , x waa 1.5 oo laga dhererka salka macanheeduna, $x = 1.5 b$



Lakin markasta oo lagu siiyo sadexagalka waa 64. Sidaas awgeed

$$x + x + b = 64$$

$$2x + b = 64$$

$$2(1.5 b) + b = 64 \quad (\text{madaama } x = 1.5 b)$$

$$\Rightarrow 3b + b = 64$$

$$\Rightarrow 4b = 64 \Rightarrow b = 16$$

$$\text{yoo } x = 1.5 b \Rightarrow x = 1.5 \times 16 = 24$$

Sidaas awgeed labada dhinac waxay yihiin 24 sm midkiiba dhinaca sadexaa dna (salka) waa 16 sm.

5. Kasoo qaad in $x =$ xadi uu arday kasta uu bixiyey. Tirada guud ee ardeyda waa $20 + 18 = 38$, oo mid kasta uu bixiyey x sidaas awgeed 38 arday waa $38 \times x = 38x$ Birr.

Isugeynta xadigan oo loo geeyey 100 Birr oo ay bixiyeen foonmisteradu waa in ay ahaato 2000 birr taas waa

$$38x + 100 = 2,000.$$

$$\Rightarrow 38x = 2000 - 100$$

$$\Rightarrow 38x = 1900 \Rightarrow x = \frac{1900}{38} = 50.$$

Taasi waxay tahay arday kasta waxa uu bixiyey Birr 50 sidaas awgeed xadiga lacageed ee ay bixiyeen 20 gabdhood waa $20 \times 50 = 1000$ Birr.

6. Kasoo qaad x inay utaagantahay tirooyinka bilaha ee (kaydinta) (dhiteyn) markaa kadib kaydinta Birr 12 ee bilkasta ee (x) ee xadiga bilkasta la bixiyo waa $12x$ Birr isugeynta xadiga oo loo geeyey 14 Birr oo ku sii jirey sanduuqa ayaa waxaa loo ga baahan yahay in ay noqoto 110 birr taasi waxay tahay

$$12x + 14 = 110$$

$$\Rightarrow 12x = 110 - 14 = 96 \Rightarrow x = \frac{96}{12} = 8$$

Sidaas awgeed waxay qaadatey 8 bilood siloo kaydiyo 110 birr.

Qiimeynt

Qiimeynta joogtada ah ayaa loo magacaabay gaar ahaan cutub hoosaadkan si loo hubiyo in dhamaan ardeydu xalin karaan isle,egyada toosan ee muujinta noocan ee ku yaala buuga ardeyga, xariijin. Kasoo qaad ardeydu in ay u adeegsadaan laylis kasta oo lagu siiyo cutub hoosaadkan howlgalada oo ay soo gudbiyaan xalkooda hubi shaqooyinka jawaab celin kasii.

Kasokow hawlgalka fasalka iyo qiimeynta joogtada ee hawl galada ardeyda, waa mid ku haboon in la siiyo ardeyda laylis ama kedis, kadib layliska, kuna falanqeeya fasalka dhexdiisa si aad uhubiso ama u saxdo khaladaadka ka muuqda hagida layliska ardeyda.

3.2 KU FAAH FAAHINTA DHEELIYADA TOOSAN

Tirada xisadaha 10 xyadan

Waxa Ardayga laga rabo

Awood xirfadeedyada (kartida)

- *Adeegso calaamada dheeliga \geq iyo \leq astaantan si loo xaliyo.*
- *Xali dheeleyada tooska ah horgalaha taban adigoo ku cabiraya xeerka isbedelka dheelyada toosan.*

Hordhac

Cutub hoosaadkani waxa uu muujinayaa tabaha xalinta dheeliyada toosan xeererka intooda badan ee aynu udeegsano si aan u xalino dheeliyada toosan waxay la mid yihiin xeerarka isku dhignaanta isbedelada ee lagu cabiro si loo xaliyo isle egta toosan, sidaas darteed aqoonta ay ardaydu ka heshey xalinta isle,egyada toosan aad ayay faaiido badan ugu leedahay ardayda.

Nuxurka waxbarista

Waa in ay ahaato falanqaynta cashirka kasoo qaad ardaydaadu in ay haayaan masalooyin ku lugleh dheeliyada kana caawi iyaga si ay xal ugu heli lahaayeen iyaga leftooda. Hawlgalka fasalka ee 3.9 waxaa looga jeedaa ujeedadan kadib hawlgalka fasalka, bar afarta calamadood ee dheeliyada taas waxay tahay “<”, “≤”, “>”, “≥” oo tibaax weedh masaladeeda kulugta leh hawlgalka fasalka 3.9 adigoo adeegsanaya dheeliyadan.

Jawaabaha Hawlgalka 3.5

1. Si cad loo fahmi karo
2. Si cadloo qeexi karo (jawaabta 35)
3. Kasoo qaad x in ay u taagan tahay dadka qofka codka bixin kara doorashada. Sidaas awgeed kazoo qaad in ay abahaa kayer yahay x waa in uu unguyaraan ahaado laba laabka sagaal taasi waa $x \geq 2 \times 9 = 18$. Sidaas awgeed da’da qofka codeynkara waa 18 ama in kabadan.
4. kasoo qaad $x =$ tirada buugta ardayda ee aad iibsato, maadaama qiimaha midkasta uu yahay 7 Birr, x waxay u taagantahay qiimaha buugta ardayda $7x$ Birr qiimahan kama bednaan karo waxaad heystaa waa, $7x \leq 50$ Sidaas awgeed, x kama weynaan karto 7. Taasi waa, tirada ugu badan ee buugta aadku iibsano karto 50 Birr waa 7.
5. Hada in taa waxaa dhaar xalada ken jirta (4) hadii aad rabto in aadi iibsato hal buugta qoraalka oo ah 12 Birr marka qiimaha x ee buugta qoraalka ardayda waa $7x$, oo loo geeyey buuga xusuus qorka unguyaraan waa in ay ahaato 50 taasi waxay tahay $7x + 12 \leq 50$

$$\Rightarrow 7x \leq 38$$

Sidaas awgeed ma awoodid in ka badan shan buugta qoraalka, taasi waxay tahay tirada ugu badan ee buugta qoraalka ee aad iibsano kartaa waa shan. Xeererka si loo xaliyo dheeliyada toosan aad bay iskugu dhowyihiin xeererka xalinta isle, egyada, gaar ahaan xeererka laga xaliyo dheeliyada toosan ee leh horgalayaasha togan waxay lamid yihiin isle, egyada toosan marka laga reebo isbedelka calaamada isle ekaasha.

Iyadoo lagu bedelayo dheeliyada si loo caawiyo ardayda xeererkan looguna dhiirigaliyo in ay ka qaybqaadaan shaqo kooxeedka 3.2.

Kadib shaqo kooxeedka iyo soo jeedinta labada xeer taas oo ah.

Xeerka 1^{aad}: Astaanta isugeynta/kalagoynta.

Xeerka 2: astaanta iskudhufashada/isuqaybinta ee tirada togan, felanqee tusaallooyin farabadan oo suurogal ah si loo xaliyo dheeliyada toosan ee leh. Horgalaha togan, ka caawi ardayda si ay uqoraan xeererka lagu cabiro si ay ubedelaan. Dheeliyada toosan aayar aayar ilaa doorsoomuhu uunoqdo mid ku takooran hal dhinnac oo ah calaamada dheeliga hab lamid ah ee xaalada xalinta.

Kadib marka ay ardayda fahmaan sida loo xaliyo dheeliyad toosan ee leh horgalaha togan ka caawi ardaydaada si ay uqoraan xeerka labaad ee kor kuxusan in aanu si toos ah ugu habooneyn, dheeliiyada toosan ee leh horgaleha taban sidaas awgeed waydii ardaydaa in ay ku cabiri karayaan xeerka labaad si ay u xaliyaan hada ardaydautoos ah ha u cabiraan xeerka labaad, markaa kadib shaqadooda waxaa laga yabaa in ay noqoto sidan

$$-2x < 6$$

$$\frac{-2x}{-2x} < \frac{6}{-2}$$

$$x < -3$$

Markaa kadib, weydii ardeydaa da in ay hubiyaan jawaabtaada, sidaas awgeed hadii $x = -4$ ta lagu bedello meesha x ee dheeligii hore, markaa waxaynoqon sidan $(-2)(-4) < 6$

$8 < 6$ (Suuroalma, aha)

Tani waxay ardayda ka caawindoontaa inaya qoonsadaan baahida xeerka kale ee ku haboon maashada marka dheeligu ku lug leeya hay horgalaha taban hadaba dhinaca taban, adigoo adeegsanaya dhowr tusaalle ka caawi ardayda si ay u fahmaan in iskudhufashada ama isuqaybinta ee labada dhinac ee dheeliga ay ku yihiin dheeli isku calaamad ah waxaa laga yaabaa in aad adeegsato sida tusaalle la bixiyey $0 < 3$ hadii aynu labada dhinac ku dhufano -1 , waxan heleynaa $0 > -3$ taas waxaa la mid ah hadii lagu siiyo $-2 < 6$ hadii aynu uu qaybino labada dhinac -2 waxaan heleynaa

$$\frac{-2x}{-2x} > \frac{6}{-2} \text{ ama } 1 > -3.$$

Kadib adigoo hubinaya in ay ardaydu fahantey saameynta iskudhafashada ama isuqaybinta ee labada dhinac ee dheeliga leh tirada taban tani waa xiliga laga sheego xeerka sadaxaad ee ku saabsan astaanta isku dhufashada ama isuqaybinta ee tirada taban, tan kadib, ku dhiirigli kanacaawi ardaydaada si ay ugu cabiraan xeerkan xalinta dheeliyada toosan ee leh horgalayaasha taban sida kuwa lagu bixiyey buuga ardeyga.

Jawaabaha Layliska 3.4

1. b. $2x - 5 < 3$, horaad $\mathbb{W} = \{0, 1, 2, 3, 4, 5, \dots\}$
 $\Rightarrow 2x \leq 8 \Rightarrow x \leq 4$
 Sidaa darteed kutiirsanaha horaadka taasoo ah in lagu qanci karo dheeligaa waxaana kuhaboon 0, 1, 2, 3, iyo 4.
 Sidaa awgeed xalinta ururkaasi waa, S.S = $\{0, 1, 2, 3, 4\}$.
- t. $3x + 1 \geq 9$, $x \in \mathbb{Z} = \{\dots, -2, -1, 0, 1, 2, \dots\}$
 $\Rightarrow 3x \geq 8$
 $\Rightarrow x \geq \frac{8}{3} = 2.677 \dots$
 Kutiirsanaha \mathbb{Z} ee kuhaboon dheeligan waa 3, 4, 5, 6, ...
 Markaa, S.S = $\{3, 4, 5, 6, \dots\}$
- j. $-2x + 5 \leq 1$, $x \in \mathbb{W} = \{0, 1, 2, 3, \dots\}$
 $\Rightarrow -2x \leq -4$
 $\Rightarrow x \geq 2$
 •• U.R = $\{2, 3, 4, \dots\}$
 Sidaa silamida waxaad kuheli kartaa su,aalahan soosocda
- x. U.R = $\{-3, -2, -1, 0, 1, 2, \dots\}$
- kh. U.R = $\{x \in \mathbb{Q} / x > \frac{7}{5}\}$
- d. U.R = $\{x \in \mathbb{Q} / x \leq \frac{-9}{10}\}$
- r. U.R = $\{x \in \mathbb{Q} / x \geq \frac{-17}{2}\}$
- s. U.R = $\{x \in \mathbb{Q} / x \geq 1\}$
2. b. $2x - 6 \leq -8$, $x \in \mathbb{W} = \{0, 1, 2, 3, \dots\}$
 $\Rightarrow 2x \leq -2$
 $\Rightarrow x \leq -1$
 Laakiin majirto wax kutiirsanaha oo kaasoo lamida ama kayar -1 maadaama xalinta ururkani uuyahay urur madhan ama U.R = $\{\}$.
- t. $x - 2(1 - x) \geq 3x$, $x \in \mathbb{Z} = \{\dots, -2, -1, 0, 1, 2, \dots\}$
 Dibuhabaynta kadib waxaad helaysaa
 $3x - 3x \geq 2$
 ama $0 \geq 2$, taasoo runkadhigaysa
 Sidaa darteed, S.S = $\{\}$

$$j. \quad -2x + 1 < 4 \left(\frac{1}{3} - \frac{1}{2}x \right), x \in \mathbb{Q}$$

Kadib markaad dib uhabayso waxaad heli

$$2x - 2x < \frac{4}{3} - 1$$

Ama $0 < \frac{1}{3}$ taasoo runku ah midkasta $x \in \mathbb{Q}$.

Sidaa awgeed S.S = \mathbb{Q}

Sidoo kale xalinta urur kani waa urur makoobne ah.

$$x. \quad 2x - 10 \leq -1, x \in \mathbb{W} = \{0, 1, 2, 3, \dots\}$$

$$\Rightarrow x \leq \frac{9}{2}$$

Habkaas kutiirsanayaasha w Taas oo kuhaboon dheeligan aah 0, 1, 2, 3, 4.

Sidaa darteed, S.S = $\{0, 1, 2, 3, 4\}$ kaasoo bardhamaad ka ah

$$kh. \quad -3x + \frac{1}{2} \leq \frac{1}{4}x, x \in \mathbb{Z} = \{\dots, -1, 0, 1, 2, \dots\}$$

Marka dibloohabeeyo kadib waxaad heli $x \geq \frac{2}{13}$. Sidoo kale z xalinta

ururkeedu waa S.S = $\{1, 2, 3, \dots\}$ Taasoo ah urur makoobne ah.

$$d. \quad 3x - 2 \geq -3(2 - x), x \in \mathbb{W} = \{0, 1, 2, \dots\}$$

Marka dib loohabeeyo kadib waxaad heli $0 \geq -4$ taasoo run kadhigaysa dhamaanba $x \in \mathbb{W}$.

Sidoo kale S.S = \mathbb{W} waa urur makoobne ah

Qiimeynta Joogtada ah

Markasta waxaad kafikirtaa waxa ardayda lagarabo marka uu dhamaado cutubhoosaad kani oo waxaad hubisaa iney ardaydu fahmeen wixii lagarabay iyo inkale, taas oo macnaheedu yahay inaad ardayda aad siisid shaqo fasal oo ay ku furfuraan dheeliyada toosan sidoo kale waa inaad siisaa shaqo guri si ay uga soo shaqeeyaan dheeliyada toosan ee leh horgaleyaasha taban. Dhiirigali ardayda oo uga shaqee laylisyadooda, hubi shaqadooda iyo jawaabcelintooda kadibna sax, shaqadooda.

3.3 KULANKA DHIDIBADA KAARTIS

Waxa laga rabo ardayga

Marka uu dhamaado cutub hoosaad, Ardayda waxay awoodi doonaan:

- *sawiraan afarta waaxood ee sallax kaartis iyo astayta barta eber, dhidibka, x iyo dhidibka y .*
- *jeexaan baraha kulan dhidibada kaartis iyagoo sheegaya kulankood.*
- *Akhriyaan kulan barkasta oo kamida sallaxad kulan ka kaartis..*
- *Sawiraan xariiqaha toosan ee kulanka sallaxa kaas oo isle’eg yadiisuyihiin $y = a$, $y = mx$, $x = b$*
- *Raadi isle’egta laxidhiidha kulan ee lagu siiyey ururka lammaanaha horsan.*
- *Raadi isle’eg xariiqda kakooban baraha lagu siiyey.*

Hordhac

Filisofar faransiis ah oo la odhan jiray Rene, Descarts (1596 - 1650) ayaa wuxuu soo saaray halka ay bar kadhaxdo salaxa. Isaga oo u kasooocaya fogaanta tooska ah ee udhaxaysa labada tiro xariiqeed. Habkani waa mid aad ufudud, faa iido badan oo aad u qotodheer kaas oo aan waligii labadalalin waxaana looyaqaanaa kulanka dhidibada kaartis hadaba cutub hoosaadkan waxaan xooga saaraynaa fikradaha akhrinta kulan baraha ee salaxa kulanka kaartis, inaga oo sawirayna xariiqda toosaan ee isle’egteedutahay $x = a$, $y = b$ iyo $y = mx$.

Gudbinta Cashirka

Bilawga cutub hoosaadka, waa inaad dhiirigalisaa a digoo kobcinaya oo caawinaya iney minguuriyaa qodobada ugu muhiimsan, ee faa iidada uleh shaqo fasalka 3.12 ee ardayda lagu siiyey buuga ardaygaa adbay ugu fiican tahay ardayda waxayna ka caawiney saa cashirkan, sida akhrinta iyo dhisida baraha kulan ka sallaxa, kadib markaad dhamaysid shaqo fasalka ardayda 3.12, ardayda ka caawi siday tirooyinka ugu isticmaali lahaayeen tirada baxtaay kadhacdo baraha xariiqda. Tirooyinka xariiqda (tirooyin taban, O, tirooyintogan) kuwaa oo loo isticmaalo barta ay barahu dhacaan ee, xariiqda waxaana loo yaqaanaa kulan dhidibada kaartis sidaas darteed dhis habka kulanka oo hubi iney ardaydu, ururin karaan tirooyinka baraha ay kadhacaan xariiqda tirada.

Ka dib marka aad ku nakhtiitid habka kulanka ee xariiqda tirada, muuji inay isu egyihiin kuwa aad isku aadisay iyo inkale oo ay yihiin habka kulanka oo kakooban lammaane horsan (x, y) barta salaxa kamida adigoo isticmaalaya laba xariiq tiro oo

isku qotoma, marka x ay u taagan tahay fogaanta jiiifka ah ee xariiqda tiro waxaana layidhaahdaa dhidibka x , y ayutaagan tahay fogaanta xariiq tiro ee qotanka ah waxaana layidhaahdaa dhidibka y markaad muujiso kadib ardayduna ha akhriyaa kulanka baraha la siiyey ee kulanka salaxa sidoo kale ha sameeyaa baro kamid kulanka salaxa.

Hawlgalka 3.7

- Jooga ardaydu waa 1, 2, 3, 4, iyo 5 waa 1.50m, 1.75m, 1.25m, 1.75m and 1.50m, siday u kala horeeyaan.

3.3.1 Afarta waaxood ee kulanka dhidibada kaartis

Ardayda xusuusi in kulan ka dhidibadu uu salaxa u qeybiyo afar qeybood oo looyaqaano:- waaxo markaa kadib ardayda waxaad utilmaan taa iney qeexaa calaamada kulanamada (x, y) ee waaxdkasta, kadibna ardayda ka caawi iney ogaadaan in waaxda 1^{aad} labada kulanba ay yihiin toganeyaal, waaxda 2^{aad} kulan (x) uu yahay tabane, kulan ka (y) uu yahay togane.

3.3.2 Kulamada iyo Xariiqda toosan

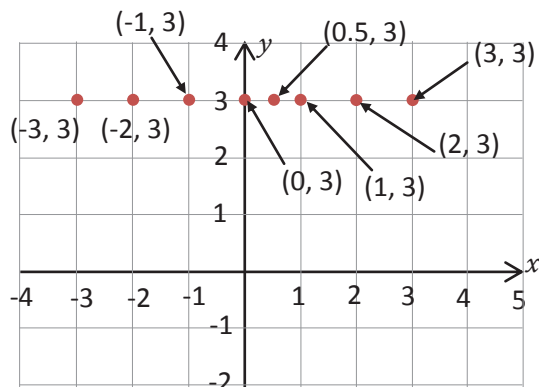
Ardaydu ha ku bilaa baan shaqo fasal 3.13. shaqo fasalka ardayda waxay ka caawin iney ardaydu dhisaan baraha xariiqda jiiifka ee dhidibka y uuyahay madoorsoomaha $(y = 3)$ iyo baraha xariiqda qotanka ah kaas oo dhidibka x uuyahay madoorsoomaha $(x = 3)$ haday si fiican uqabtaan ardayda waxay kacaawin iney xusuustaan dhamaan baraha uu dhidibka y , $(y = 3)$ marka dhidibka x yahay tiro kasta oo tiro lakab ah taasoo xariiqdu maro $(0, 3)$. Hawlgalkani wuxuu ka caawinayaa sidaas silamida iney uga shaqeeyaan dhidibka x , $x = 3$.

Kadib marka ay ka shaqeeyaan shaqo fasalka 3.13, ardayda u tilmaan iney sawiraan xariiqaha jiiifa kuwaas oo isle'egtoodunatahay $y = c$, marka $c \in \mathbb{Q}$, iyo xariiqda qotonka ah ee isle'egteedu tahay $x = c$, marka $c \in \mathbb{Q}$. Marka ay ardaydu sawirayaan ka caawi inaad u sheegtid inay samaayaan shaxda qiimaha x iyo y kuwaas oo ina siinaya isle'egta qiimaha aan u isticmaalayno sawirka xariiqda tiro ee la ina wey diiyey.

Hadaba waxaad, hubisaa dhamaada cashirkan iney fahmeen $y = c$, marka $c \in \mathbb{Q}$, aytahay isle'egta xariiqda jiiifka taas oo iskajarta dhidib y , $(0, c)$; halka $x = c$. marka $c \in \mathbb{Q}$, ay katahay isle'egta xariiqda qotonka ah ee dhidibka x , ee iskajarta $(c, 0)$.

Hawlgalka 3.8

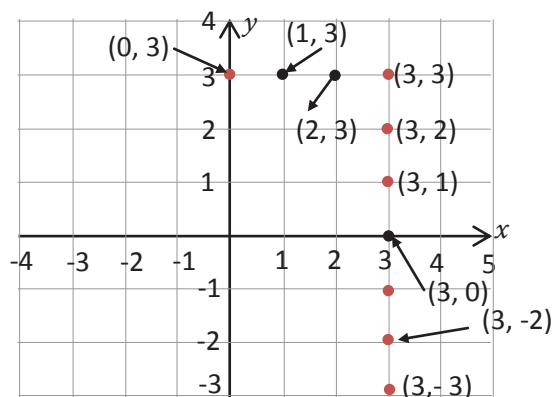
1. b.



t. Baraha kamuuqda salax, waxay isugu beegan yihiin mid mid, siday ukala horeeyaan ee dhinaca bidix iyo dhinac midig.

j. haddii aad isku daydid inaad dhistid dhamaan dhidibada y , ee ay $y = 3$ laakiin dhidib x , aytahay tiro kasta oo tiro lakab ah markaa baruhu waa xariiqda jiifka ah taas oo dhex marta $(0, 3)$ iyo $(1, 3)$.

2.



Baraha ka muuqda salaxa dushiisa waxay isugu beeganyihiin mid mid, siday ukala horeeyaan ee hoos ilaa kor.

2. i. Haddii aad iskudaydid inaad qortid dhamaan dhidibada x , oo ay $x = 3$ laakiin dhidibka y , ay tahay tiro kasta oo tiro lakab ah markaa baruhu waa xariiqda qotonta ee dhexmaraysa $(3, 0)$ iyo $(3, 1)$.

Kadib isku day inaad ardayda xusuusid, isticmaalka iyo isle’egta janjeedhka xariiq da tirada ee dhexmarta barta eber, u sharax calaamadaha saamigal tooska ah ee

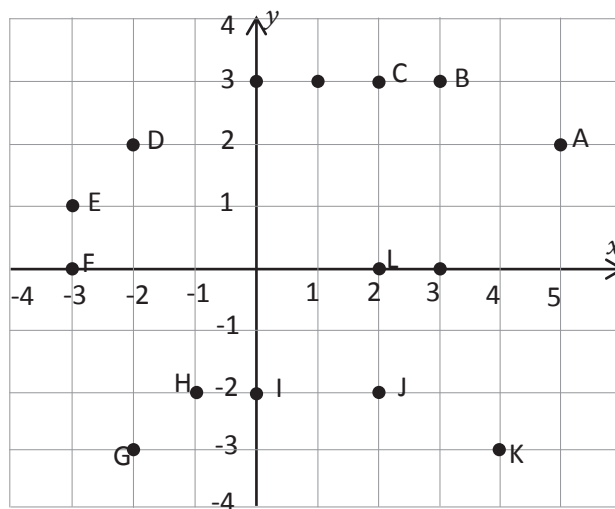
fogaan uu baabuurku socday iyo wakhtigii ay ku qaadatay adigoo isticmaalaya tusaalaha iyo kuwo kalaba ardayda kacaawi inaa xusuusid inlaba xadi, oo kala x iyo y ay yihiin saamigal toosan haddii $\frac{y}{x} = m$, tiro madoorsoome $m \neq 0$ taas oo ah $y = mx$.

Munaaqashada (kawada hadala) kadib madoorsoomaha saamigal ah ee kucad labada cadad (tiro) kacaawi ardaydaada inay sawiraan xariiqyo kuwaas oo isle, egyada qaabka ah $y = mx$, halka $m \in \mathbb{Q}$, $m \neq 0$, in looga dooda qaababka hoos kuxusan:

1. Samee soo bandhiga jadwalka Qiimeynta. Taasoo aad Dooranaysid kuwo fudud oo Tirooyin ah x habayn teed adoo leh $x_1 = -2$, $x_2 = -1$, $x_3 = 0$, $x_4 = 1$, $x_5 = 2$ iyo isticmaal isle'egta $y = mx$ sidaad uhesho isku beegnaanta $y =$ habaynta y_1, y_2, y_3, y_4, y_5 , iyadoo latixgalinayo.
2. Meesha $(x_1, y_1), (x_2, y_2), \dots, (x_5, y_5)$ qaabka habaynta.
3. Sawir xariiq barahan dhexmaraysa.

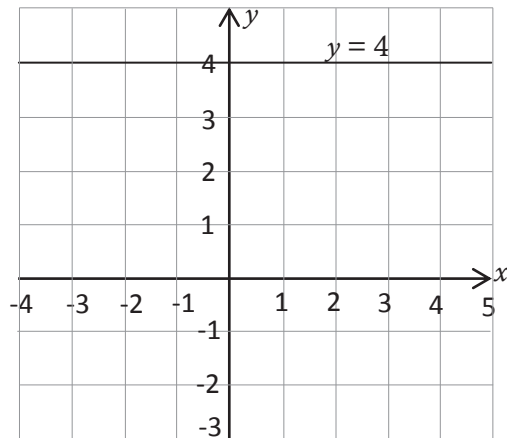
Jawaabaha layliga 3.5

1. $A = (4, 4)$, $B = (2, 3)$, $C = (0, 2)$, $D = (-1, 1)$, $E = (-2, 4)$, $F = (-2, 0)$, $G = (-3, -2)$, $H = (0, -1)$, $I = (1, -2)$, $J = (3, -1)$ iyo $K = (3, 0)$.
- 2.



3. A iyo B waa waaxda 1^{aad}
 D iyo E waa waaxda 2^{aad}
 G iyo H waa waaxda 3^{aad}
 J iyo K waa waaxda 4^{aad}
 L iyo F waa dhidibada x
 C iyo I waa dhidibada y

4. b.

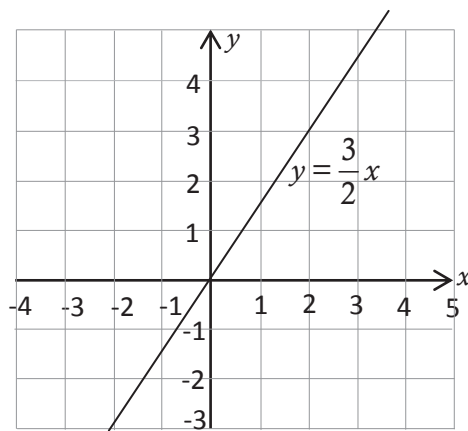
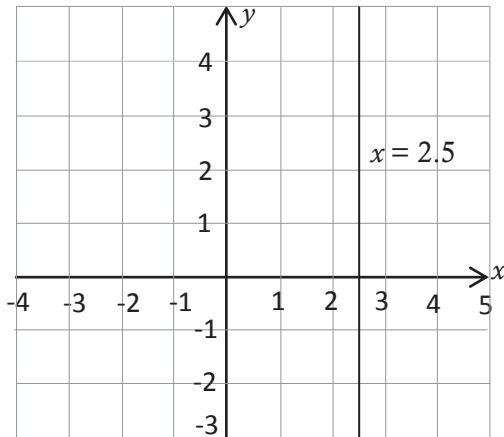


t. $y = 0$ waa dhidibka x laftiisa

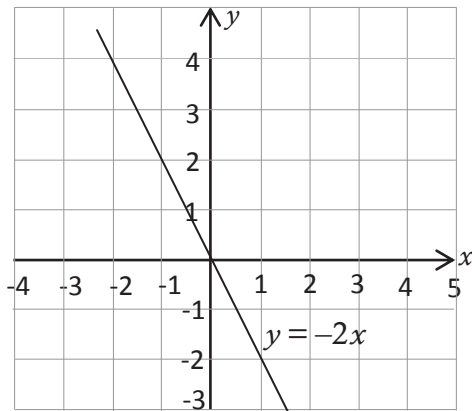
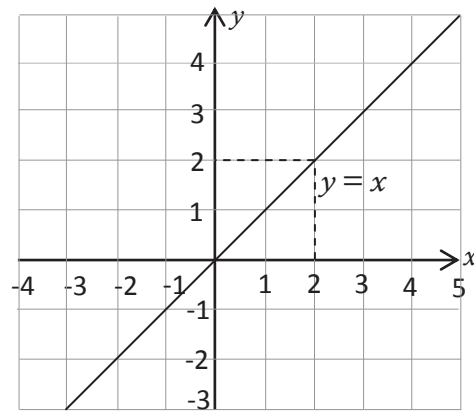
j. $x = 0$ waa dhidibka y laftiisa

x.

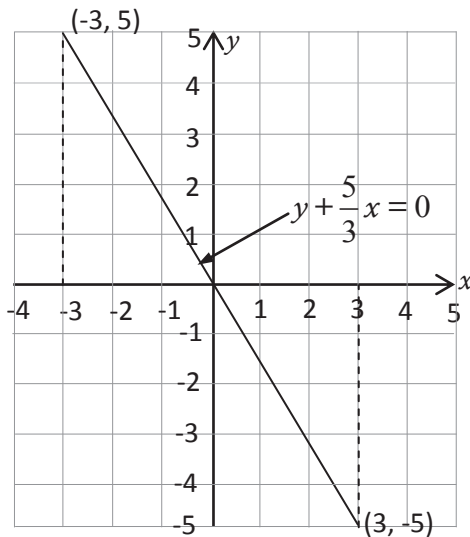
kh.



d.

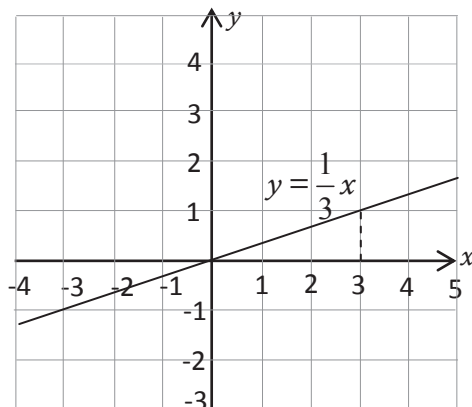
r. $y - x = 0 \Rightarrow y = x$ 

s.

5. Marka hubi in y saamigal toos ah utahay x .Taas oo lagu siiyey (x, y) , hubi in $\frac{y}{x} = m$. Here,

- $(-3, -1) \Rightarrow \frac{-1}{-3} = \frac{1}{3}$
- $(3, 1) \Rightarrow$ saamiga $\frac{y}{x}$ waa $\frac{1}{3}$
- $(6, 2) \Rightarrow \frac{2}{6} = \frac{1}{3}$
- $(9, 3) \Rightarrow \frac{3}{9} = \frac{1}{3}$

Sidaas darteed lammanaha horsan (x, y) waxaan haysano $\frac{y}{x} = \frac{1}{3}$. Sidaas darteed, $y = \frac{1}{3}x$ waa isle’egta xariiqda.



Qiimeyn

Adigoo samaynaya qiimeyn joogto ah waxaa lagu talinayaa inaad wada falan qeysaan ama aad fiirisaan waxa ay ardaydu qaban karan markaad siisid, shaqo fasalka ama shaqo guri tijaaboyin iyo imtixaanadu waxay ufiican yihiin dadaalada qiimeynta joog tada ah iyadoo la tixgalinayo cutub hoosaadkan lana weydiinayo ardayda.

- Iney raadiyaa kulanada baraha
- Iney sawiraan kulanada sallaxa ku waasoo lasiiyey lammanayaa shooda
- Iney sheegaan waaxda uu yahay
- Iney sawiraan xariiqaha ay isle’egtoodu tahay
 - $x = a$ (xariiqda jiif)
 - $y = b$ (Xariiqda qotonka ah)
 - $y = mx$ (Tiirada dhaxmarta barta eber)

Marka $a, b, m \in \mathbb{Q}$.

Fur-furista layliska nakh tiinka ee Cutubka 3^{aad}

- | | | | | |
|----|----|------------------------------------|-----|---|
| 1. | b. | S.S = {1} | kh. | S.S = Q |
| | t. | S.S = {9} | d. | S.S = {3} |
| | j. | S.S = $\left\{\frac{1}{3}\right\}$ | r. | $x = 2 - 2 [2x - 3(1 - x)]$ |
| | x. | S.S = { } | | $\Rightarrow x = 2 - 2 [2x - 3 + 3x]$ |
| | | | | $\Rightarrow x = 2 - 2 (5x - 3)$ |
| | | | | $\Rightarrow x = 2 - 10x + 6 \Rightarrow 11x = 8$ |
| | | | | $\therefore \text{S.S} = \left\{\frac{8}{11}\right\}$ |

2. $F = \frac{9}{5}c + 32$, iyo $F = 68^\circ \Rightarrow 68 = \frac{9}{5}c + 32$ markaa waxaan heleynaa
- Hadaba heerkulku waa 20° .
3. x uqaado ineytahay xadiga arday waliba kaga qeyb galayo sidaas darteed haddii ardaydu tahay 35, $35x$. Marka lagu daro 250, kii aybixiyeen xisaabaadku waana 695, natiijadu waa
- $$35x + 250 = 695 \Rightarrow x = 12.72$$
- Sidaas darteed xadiga ayardaydu kaqeybgaleen waa Birr 12.72
4. $x =$ uqaado inaytahay xadiga uu arday waliba kaga qaybgalayo
 $y =$ uqaado inay tahay xadiga macalin walba kaga qeyb galayo.
 Sidaas darteed, $20x + 5y = 350$.
 Laakiin $y = x + 10$.
 $\therefore 20x + 5(x + 10) = 350$
 $\Rightarrow x = 12$, marka $y = 12 + 10 = 22$.
 Sidaas darteed, xadiga uu ardaykastaa kaga qeyb galay waa Birr 12, sidoo kale xadiga macalin kasta kaga qeyb galayan waa Birr 22.
5. $x =$ uqaado inaytahay lacagta ah ee aad ku bixineysid koronta (ee kwh).
 Maadaama kwh yahay 40 sent = 0.40, haddii xadiga waa x kwh tan oo $0.40x = 0.4x$. Hadaba aan kudaro 10 birr oo adeega ah waa sidan xadiga aad bixinaysid $0.4x + 10$ Birr aan u qaadano qiimaha ugu badan ee aan bixineynaa inuu yahay $0.4x + 10 \leq 40 \Rightarrow x \leq 75$
 Sidaas darteed lacagta aad kubixineysid korontadu waa 75 kwh = 30 Birr.
6. b. S.S = $\{0, 1, 2, \dots, 8\}$
 t. S.S = $\{x \in \mathbb{Q} / x \geq \frac{5}{4}\}$
 j. S.S = $\{ \}$
 x. S.S = $\{x \in \mathbb{Q} / x \leq -\frac{1}{2}\}$
 kh. S.S = \mathbb{Q} , urur ka tirooyinka lab.
 d. S.S = $\{x \in \mathbb{Q} / x \geq -\}$
 r. S.S = $\{ \}$

7. Kasooqaad $p(x, y)$ waa barta kulan dhidibada kaartis

a. $x > 0$ iyo $y > 0 \Rightarrow p(x, y)$ waa waaxda 1^{aad}.

b. $x < 0$ iyo $y < 0 \Rightarrow p(x, y)$ waa waaxda 3^{aad}.

c. $x > 0$ iyo $y < 0 \Rightarrow p(x, y)$ waa waaxda 4^{aad}.

d. $x < 0$ iyo $y > 0 \Rightarrow p(x, y)$ waa waaxda 2^{aad}.

e. $x = 0 \Rightarrow p(x, y)$ waa dhidibka y .

8. Way iska cadahay.

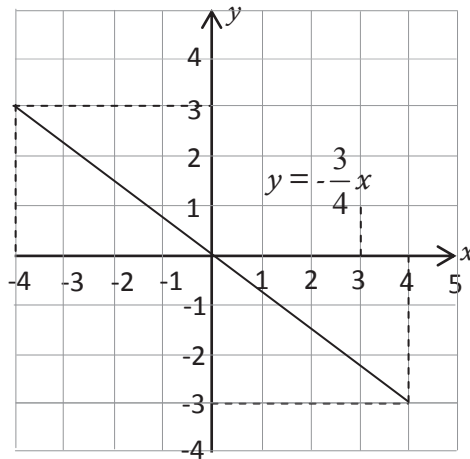
9. Uqaado $(x, y) = (-8, 6) \Rightarrow \frac{y}{x} = \frac{6}{-8} = \frac{-3}{4}$

$$(x, y) = (-4, 3) \Rightarrow \frac{y}{x} = \frac{-3}{4}$$

$$(x, y) = (8, -6) \Rightarrow \frac{y}{x} = \frac{-6}{8} = \frac{-3}{4}$$

Sidaas darteed $(x, y), \frac{y}{x} = \frac{-3}{4}$

$$\Rightarrow y = \frac{-3}{4}x \text{ waa isle'egta xariiqda.}$$



CUTUBKA **4** ISU, EKAASNKAHA SHAXANADA

HORDHAC

Cutubkan waxaan ku barandoonaa. Sadex qaybood oo muhiim ah waxay kala yihiin

1. Waa in ay ardaydu ogaadaan fikirada isu, ekaanshaha shaxanada
2. Waa in ay fahmaan xaladaha cadaynaya – sida laba sadex xagal loo simo
3. Waa in ay awoodaan wadiiqooyinka ama doorka loo simo xeerka si looxisaabiyo labada – sadex-xagal ee lagu siiyey in ay simin yihiin iyo in kale

in ay ardaydu fiiriyaan farqiga u dhexeeya

Labada shaxan oo leh qaab isku mida Lakiin ku kala duwan xajmiga

Tusaalle ahaan. Waxaa laga yabaa in aad aragto sawirka halqof oo mid yaryahay midna weyn yahay; iyo halnooc oo gaadhi ah oo mid yar yahay midna weyn yahay hal kaas waxaad ka garan kartaa iney leeyihiin qaab isku mida Lakiin ay ku kala duwan yihiin xajmiga/cabirka

Cutubkan waxaan ku baranayaan doonaan. Laba shaxan ama laba shey oo leh qaab isku mid ah

Lakiin ku kala duwan xariijin/(cabirka) ama (baaxad)

Sidoon kale waxaan si sax ah ugu baran doonaa in laba shaxan ama laba shey siman yihiin iyo in kale.

Ujeedada Cutubka

Kadib markuu dhamaado cutub kan Ardeydu waxay awoodi doonaan

- Fikirada isu ekaanshaha shaxanada iyo xidhiidhka eray cilmiyeedka
- In ay fahmaan sida loo simo sedex, xagalada
- Iyo sida loo ogaado' laba sedex xagal oo lagu siiyey inay isu,egyihiin iyo in kale

Kabayaasha loo adeegsanayo

Si aad u barto cutubkan waxaa loo baahan yahay in aad adeegsato kebayaashan soo socda

- *Mastarad iyo qalabka lagu cabiro sedex xagalada*
- *Khariirada ina tusaysa kala duwanshaha laba shaxan iyo Isuekaanshaha laba shaxan yaraynta iyo weyneynta sawirka*

4.1 ISU EKAANSHAHA

(8 Xiso)

Waxa Lagarabo Ardayda

Dhamaadka cutubkan ardaydu waxay awoodi doonaan

- *Iney kalasaaraan shaxanada siman eemid midka kale uga egyahay*
- *Iney sharaxaan fikrada guud ee isu ekaanshaha*
- *Sawirada shaxanada lawayneeyey ee walax lagusiiyey Adigoo wayNeynaya sameyska Walaxda*
- *Iyo sawirada shaxan layareeyey oo lagusiiyey Adigoo yareynaya sameyska walaxda*

Macnaha erayada

Isu ekaanshaha shaxanada:- isu ekaan shuhu wuxuu sheegayaa

Xaglaha isudhigma, dhinacyada isudhigma

xaglaha isu, eg, dhinacyada isudhigma i.w.m

Hordhac

- Qeybta cutubkan ardayda waxaa lagadoonayaa iney qeexi karaan Isu-ekaanshaha Shaxanada siman
- Ka hor qeexitaanka Isu-ekaanshaha shaxanada siman
- Waa in cashirka lagubilaabo su,aalo siloofiiriyo/Loofahmo lamaanaha shaxanada siman oo ayardaydu kaqeybqaadtaan
- Iyo iskudayida siloo go aamiyo inay siman yihiin iyo inkale iyadoo aykusaleysantahay khibradaha ay iska helaan kaqeybqaadasha iyo kahadalka waxqabadyadan soo socda:- qeexitaanka isu ekaanshaha shaxanada, Hadaba cutubkan waxaallooqeybinayaa:- laba qeybood ookala ah

Qeybta 1^{aad} oo kusaabsan isu-ekaanshaha shaxanada siman

Qeybta 2^{aad} oo kusaabsan waynaynta iyo yareynta shaxanada lagusiiyey Adoo Adeegsanaya cabir

4.1.1 Sawirida iyo qeexitaanka Isu-ekaanshaha shaxanada

Waxaalagayaabaa inaad waydiiso Ardayda inay fahmeen isu-ekaanshaha shaxanada kadibna waydii inay tusaale kabixin karaan

Isu-ekaanshaha shaxanada iyagoo Adeegsanaya Aqoontooda.

Kadibna kudhiirigali inay kaqeybqataan shaqada ardayda shaqsi shaqsi iyo koox koox iyagoo is kaashanaya u ogolow inay kawadahadlaan fikradda kadib markay kawadahadlaan waydii su aalo khuseeya isudhiganka xaglaha iyo iskudhiganka dhinacyada kadib sii Jawaabo laxidhiidha iskudhiganka dhinacyada iyo iskubeeznaanta xaglaha Adigoo isticmaalaya buuga ardayga iyo kaaga kadibna sii qeexitaanka Isu-ekaanshaha shaxanada Isticmaal tusaalaha buuga ardayga iyo kaaga. Tusaaluhu wuxuu ardayda kacaawinayaa inay fahmaan qeexitaan kadib fahanka qeexitaanka Isu-ekaanshaha shaxanda usheeg ardayda inay kulaabtaan shaqada ardaydu ayna cadeeyaan Jawaabahooda lamaane kasta oo sawir ah

Jawaabaha Hawlgalka 4.1

- b) Laba labajibaarane way Isku egyihiin Maxaayeelay Iskubeeznaanta xaglahooda Way iskudhigmaan (dhamaan Waa xaglo quman) iyo Iskubeeznaanta dhinacyadoodu waa saami Iskumid ah
- t) Laba sadex xagal way isku egyihiin maxaayaaley Iskubeeznaanta xaglahoodu way Isudhigmaan (midkaska waa 60%) sidoo kale Iskubeeznaanta dhinacyadood Waa saami iskumid ah
- j) Laba sadex xagal oo quman sadex xagalka say laba xaglood ay quman yihiin Ma aha lagamamaarmaan inay Isu-ekaadaan Maxaayeelay Wax-warbxiin ah la inagama siinin xaglaha hadhay iyo dhinacyadooda
- x) Sidookale laba laydi iskubeeznaanta Xaglahoodu way Isudhigmaan (dhamaan Waa xaglo quman) hadaba Waxba la inagamasiihin dhinacyadooda sidaas awgeed kumakoobi karno in laba laydi isku-egyihiin
- kh) Laba lix geesoodle way Isu-egyihin maxaayaaley Iskubeeznaanta Xaglahoodii way Isu-dhigmaan (midkasta waa 120⁰) saamiga Iskubeeznaanta dhinacyadoodu waa Iskumid

Kadib kawadahalka tusaalayaasha laraacayo siloo qeexo isu ekaanshaha shaxanka shangoosoole ah ee buuga ardayga iyo buugaaga

Kudhiirigali inay ardayda inay kashaqeyyaan layliska 4.1,

Su'aalaha ardaydu waxay Kagasooshaqeyyaan guriga, fasalka. Kadib markay ardaydu kadaalaan layliska 4.1

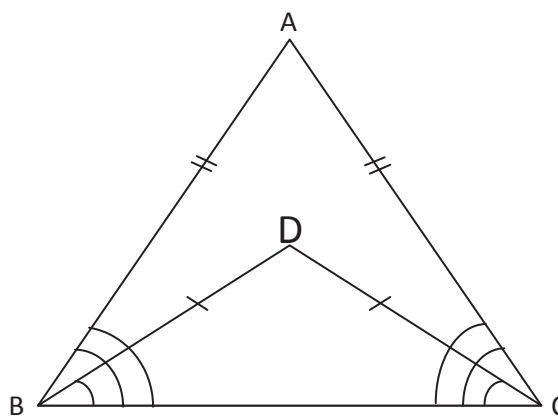
Ha iloobin in aad siiso jawaabaha ha ka doodaan layliska su.aalkasta

Jawaabaha layliska 4.1

1. laba sadex xagal oo isku sargo'ani way Isu-egyihiim maxaayeelay qeexda Iskudignaanta sadex xagaloodu, Iskubeeznaanta Xaglahoodii way Isudhiigaan taa waxaadheer Iskeebegnaan dhinacyadood iskudhigmaan saamigooduna waa hal (1)
2. Qeexitaanka sadexda dhinac ee sadex-xagalka isu, eg way Isudhigmaan. Sidaas Awgeed saamiga Iskubeeznaanta dhinacyadoodu ee Labasadex-xagal oo siman waa Joogto intaa waxaa dheer maadaama xagalkasta Aytahay Sadex Xagal siman oo cabirkeedu yahay 60° sidaas darteed Isubeeznaanta xaglaha labasadex-xagal ee simani way-isudhigmaan
3. Qeexitaanka iyo Astamaha shaxanka Afargeesleha ah. Waxaan ognahay indhinacyada Iskasoo horjeeda Ay barbaroyihin, Ayna Iskudhigmaan xaglaha Iskasoo-horjeedaana Iskudhigmaan Waana Janjeedhka ukalagooya midmiid waxaan usimi karnaa sidhibyar
 - i. $\Delta POQ \cong \Delta ROS$
 - iii. $\Delta PSR \cong \Delta RQP$ iyo
 - ii. $\Delta POS \cong \Delta ROS$
 - iv. $\Delta PSQ \cong \Delta RQS$

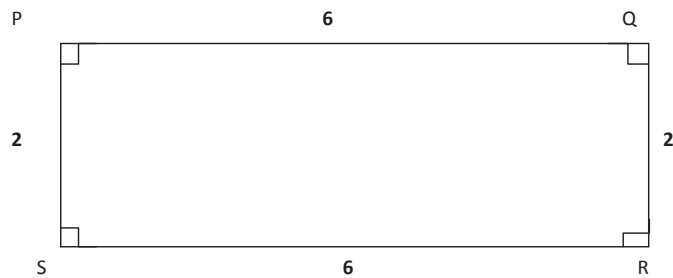
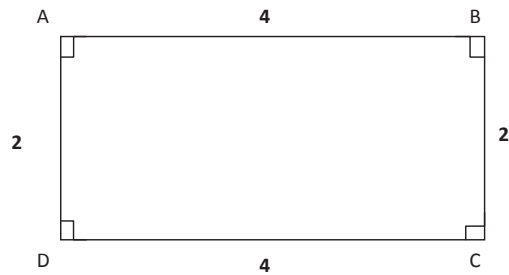
Maadaama sadex. Xagalada Isudhigmaan Isu-egyihin

4. Isuma dhigmaan maxaayaaley Iskubeeznaanta Xaglahoodu lagamayaabo inay Iskudhigmaan iyo Iskubeeznaanta noocy adoodu lagamayaabo inay saami quman isunoqdaan fiiri sadex xagalada ABC iyo DBC ee shaxanka halka kamuuqda $\overline{AB} \cong \overline{AC}$ iyo $\overline{DB} \cong \overline{DC}$ Isuma eka sida Iskubeeznaanta xaglahooda ayna isugu dhigmin iskubeeznaanta dhiinacyada Isumidka ahi waa saami quman Xusuusnow



$$\frac{AB}{DB} = \frac{AC}{DC} \text{ lakiin } \frac{AB}{DB} \neq \frac{BC}{BC} = 1$$

- Maxaayeelay iskubeeznaantu xagluhu way iskudhigmaan lakiin lagamayaabo inay isudhigmaan dhinacyadu
- Sida aykutusayaan shaxanada/jaantusyadi



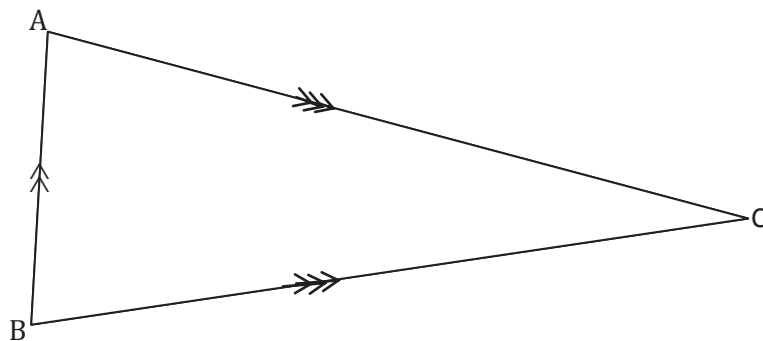
– Laydiga ABCD iyo PQRS Waxayleeyihiin/Waxaa isudhigma Xagladoooha iyo laakiin dhinacyadooda Isumadhigmaan

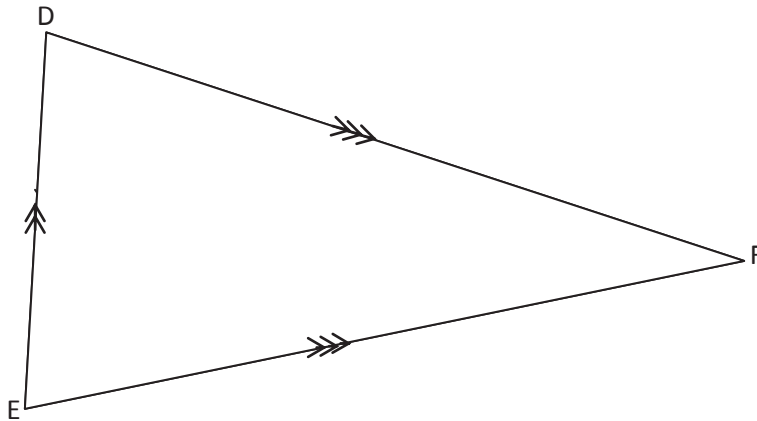
5. Kasooqaad in dhererka dhinacyada isudhigma ee Afargeeslaha labaad yahay S_1, S_2, S_3 iyo S_4 Ay yihiin 12cm

$$\text{Kadib } \frac{S_1}{3} = \frac{S_2}{5} = \frac{S_3}{7} = \frac{S_4}{9} = \frac{12}{9}$$

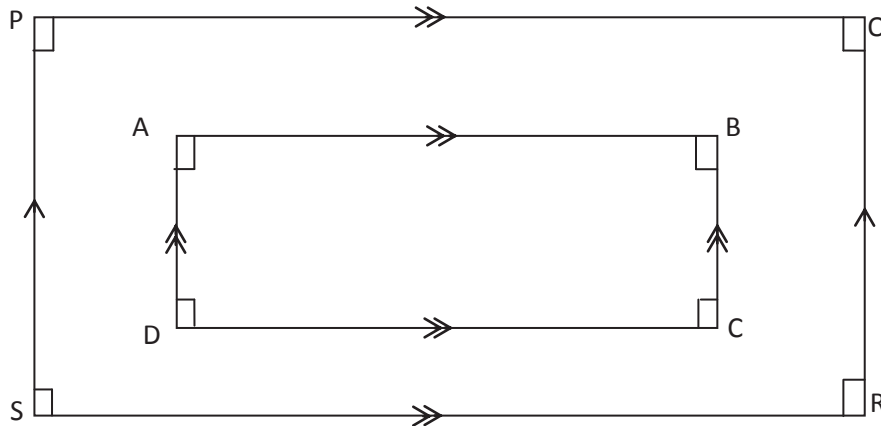
Xalin S_1, S_2 iyo S_3 haddii labad badalo waxaan helaynaa $S_1 = 4\text{cm}, S_2 = 6.67\text{cm}$ iyo $S_3 = 9.34\text{cm}$

6. Kasooqaad in $\triangle ABC$ ee sadex xagal lagusiiyey si aad usoo saarto Isu.ekaanshaha $\triangle ABC$, Waxaa kufilan in aad sawirto layman is barbar-yaal oo dhinac kasta ah ee $\triangle ABC$ sidan jaantusku inatusayo





- i. Hadii \overline{DE} , \overline{EF} iyo \overline{DF} loosawiro sibarbaro ah markaa \overline{AB} , \overline{BC} iyo \overline{AC} Way isudhigmaan Kadibna $\triangle ABC$ iyo $\triangle DEF$ way isku egyihiin $\triangle DEF$ Wuxuukaweynyahay $\triangle ABC$
 - ii. Sadex-xagalka yar oo ah $\triangle ABC$ sidookale waxaa loo sawiraa habkan habay iskumidyihiin.
7. Waxaa loo adeegsankaraa inkabadan lix hab laakiin fogaanta xariiqaha sida isbarbaryaalka u sawiran sidaa awgeed dhinacyada hoose waa in ay isle ekaadaan sida Jaantusku inatusayo



- i. Marka si,barbaro ah loosimo xariiqaha dibadu waxay inasiiyaan laydiga ABCD
Waxaan Aragnaa laydiga PQRS wuu ka weyn yahay laydiga ABCD
- ii. Markii si barbaro Xariiqaha gudaha waxay inasiiyaan laydiga ABCD
Waxaan Aragnaa in laydiga PQRS uu kayaryahay laydigu “ABCD” hadii Jaantus cabir qiyaaseedka ladoono sidii loo wayneynlahaa/yareynlahaa Waxaalagaga hadli doonaa qaybta (4.1.2)

8. Maxaayeelay dhinaca dariska ee laydiga cusub waa 6 iyo 8 oo ah cabirka weyn

Markaan kuxisaabtano iskubeegnaanta dhinacyada hoose waxaan helaynaa

$$\frac{4}{5} \text{ iyo } \frac{6}{8} \text{ kuwaas oo Aan aheyn saami iskumid ah}$$

4.1.2 Sameyska cabir qiyaaseedka iyo saamiga quman

Waydii ardayda inay waxka fahmeen sida loowayneeyo ama looyareeyo

Siwirada Sawirweyn ama yareynta kaasoo kuhaboon adigoo tusaale siinaya kudhiirigali inay kaqeyb qaataan su.aalaha 4.2

Tus sida loowayneeyo sadex-xagal Adoo isticmaalayo Sameyska Cabirka ha iloobin inay qoraan $\triangle ABC$ kunaqoraan buugooda kadib kashaqee su, aalaha sida uguhaboon

Ardayda kasax oo kacaawi waayo gabogabeda ayaykhaldikaraan kadib marka Ay ardaydu aydhameeyso cabiraada kudhiirigali inay kawadahadlaan Jawaabahooda kuwa wanaagsan ee ay Iskubeegmaan xaglaha iyo dhinacyadoodu ee sadex xagalada $A'B'C'$. Usheeg hadii ayJawaabtoodu saxtahay Waxaalagayaabaa in ayhelaan iskubeegnaanta xaglaha iyo Iskudhiganka dhinacyada iyo Iskubeegnaanta dhinacyada saamiga quman Isu ah kadib xooji fikrada ardayda Adoo I sticmaalaya buuga Ardayga iyo Tusaalayaashaada ugu danbeyn waydii ardayda inay uga wadasha qeeyaan koox koox qeybtan hoose ee ku saabsan yaraynta laydigan la siieyay ee ah ABCD iyagoo isticmaalaya cabiraada $\frac{1}{13}$ raacayana Tusaalayaashii hore.

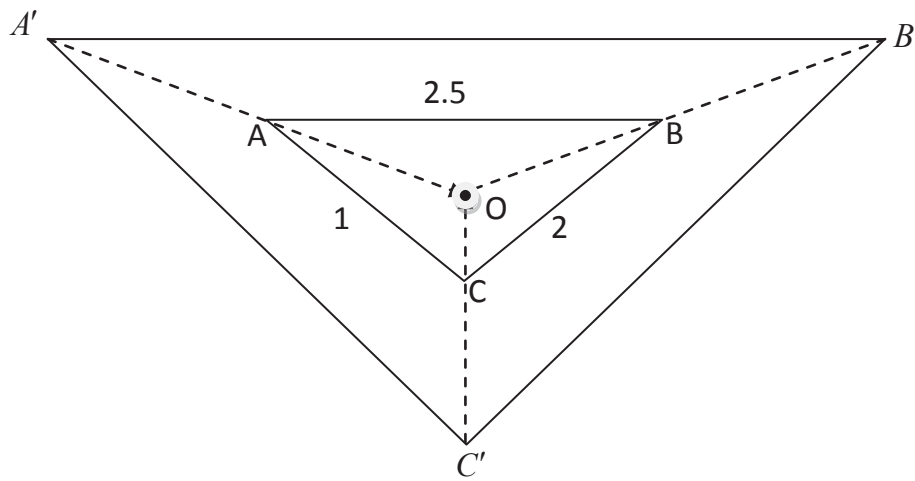
Kadib marka aydhameeyaan layliska 4.2 ay ka wadahadlayaan koox-koox Ahaan ama shaqo guri kadhig ama tus fasalka jawaabihi isuurtagalka ah ee layliska 4.2 kuwan oo ah sidan hoos ku xusan;

Jawaabaha Laylis 4.2

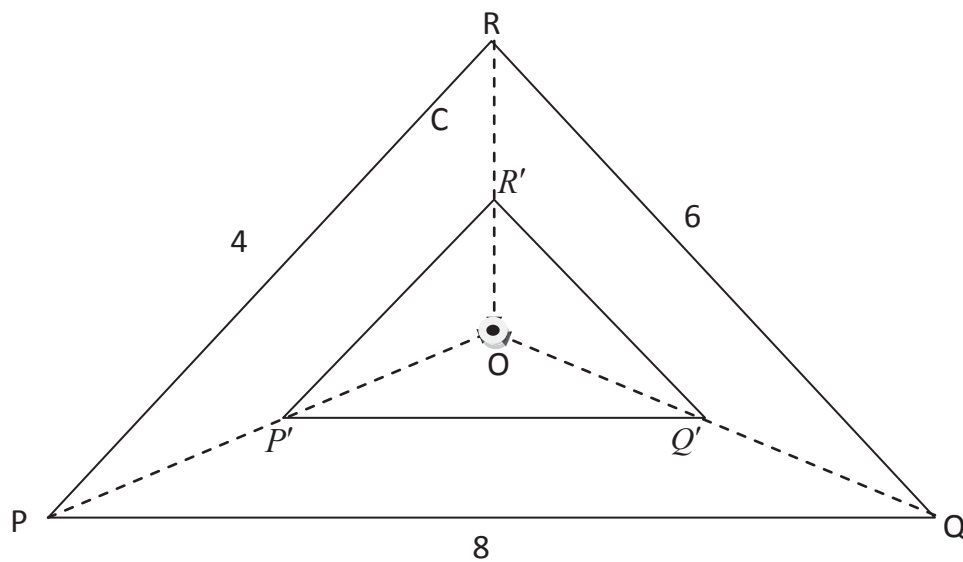
1. Qor $\triangle ABC$ adigoo ku qoraya warqad intaad kasoo qaado in dhinackasta oo gudahu uu yahay "O" $\triangle ABC$, dhanka \overrightarrow{OA} qaado barta A' sidaa awgeed

$$OA' = 3(OA)$$

Si Isku mid ah uqaado B' dhanka \overrightarrow{OB} iyo C' dhanka \overrightarrow{OC} sidaadarteed $OB' = 3(OB)$ iyo $OC' = 3(OC)$ kadib sawir $\overrightarrow{AB'}$, $\overrightarrow{A'C'}$ iyo $\triangle A'B'C'$ waa sadex xagalka loo baahan yahay oo ah kan hoos ku xusan.



2. Su aashan waxaallooga shaqeyey si lamidah sida looga shaqeyey su aasha koowaad (1^{aad})



3. Qaado barta eber ee gudaha sadex.xagalka ah (ΔPQR) kadib barta \overline{OP} , \overline{OR} iyo \overline{OQ} qaado $OP = 4(OP')$, $OR = 4(OR')$ iyo $OQ = 4(OQ')$ kadib $\Delta P'Q'R'$ waxaa loo baahan yahay sadex. Xagalkan
4. Kan sidoo kale waxaa loosameeyey si, isku mid ah taasoo ah qaadashada, barta “o” ee gudaha labaJibaarka ABCD kadib marka \overline{OA} , \overline{OB} , \overline{OC} iyo \overline{OD} qaado baraha A' , B' , C' iyo D' sida Ay ukala horeeyaan Sidaa darteed $OA = 3(OA')$, $OB = 3(OB')$, $OC = 3(OC')$ iyo $OD = 3(OD')$ kadib sawir laba Jibaaranaha A' , B' , C' D' kaasoo ah ka koowaad ee loo baahan yahay

5. Waxaan fiirinaynaa dhinaca cusub (oolahaLay isagoo lawaynaynayo/ layareynayo) Waa shaxan saami quman ah iskubeeznaanta dhinacyadooda. Taas oo ina siinaysa shaxanka iyo iskubeeznaata xaglahooda Iskudhigma. Shaxanka ugu gaaban waxaa helaynaa inaga oo Waynayna/ Yareyna shaxanka la ina siiyey kaas oo u, eg shaxanka Asalka ah.
6. Waxaa laga yaabaa inaad/siiso Arday awood sare leh ee fasalka dhexdiisa hadii sitaxadarleh loo cabiro ΔABC iyo A', B', C' Waxaan haleynaa Isu.ekaanshahooda.
Waxaa lagayaabaa in aad isticmaasho layliska si, aad u qeexo hababka bandhigida filmka taasoo Ah hadii “O” aytahay barta isha ileyska meesha ΔABC ay tahay meesha filmka iyo baahinta midabka kadib meesha $\Delta A'B'C'$ ay tahay meesha gidaarka kaas oo ah meesha filmka lagu soo bandhigo

4.2 ISU-EKAANSHAHA SADEX-XAGALADA

(17 Xiso)

Ujeedada cutubkan

Dhamaadka cutubkan ardaydu waxay Awoodidoonaan

- Inay qeexaan xaqiiqda ku saabsan isu-ekaanshaha laba sadex-xagal
- Inay sheegaan qeexda Isu ekaanshaha laba sadex xagal si ay u xaliyaan su.aalaha laxidhiidha
- Sheeg/kalasar SSS, SAS iyo AA tijaabooyin Isu-ekaanshaha ee sadex xagalada si aad ugo’ aansato Isu-ekaanshaha laba sadex.xagal
- Qeex sida wareega kore ee laba sadex-xagal u xidhiidhaan
- Qeex sida bedka laba sadex xagal oo Isku – eg. U xidhiidhaan

Ereyo Cusub

Isu.ekaanshiyaha sadex.xagalada xaglaha Iskubeezan Iskubeeznaanta. dhinacyada. Xaglaha Isudhigma. Dhinacyada saamiga quman Isu ekaanshiyaha Aragtiinada “AA” Isu.ekaanshiyaha “SSS” Isu ekaanshiyaha Aragtiinada “SAS”

Hordhac

Qeybtii hore ardaydu waxay soo arkeen Isu-ekaanshiyaha shaxanada siman cabir qiyaaseedka iyo saamiyo aad u kooban qeybtan waxay ku barandoonaan tijaabinta Isu.ekaanshiyaha sadex xagalada iyo Astaamaha Isku midka ah ee isu.ekaanshiyaha sadex xagalada iyo xadhiidhka wareegooda kore iyo bedkooda sidaa. Awgeed waxay awoodidoonaan inay xaliyaan su’ aalaha la xidhiidha nololmaalmeedkooda.

Qeybhoosaadka cutubkan waxaa looqeybiyaa sadex qeybood

- qeybta koowaad waa hordhaca Isu-ekaanshiyaha sadex xagalada iyo inay ina siiso qeexda Isu-ekaanshiyaha sadex xagalada kuwaas oo laqeeex ah Isku. Ekaanshaha Afar geeslaha
- Qeybta labaad waa kawadahadlida Isu-ekaanshiyaha sadex xagalada
- Qeybtasadexaad waxay laxidhiidhaa wareega kore iyo bedka Isu-ekaanshiyaha sadex-xagalada

4.2.1 isu-ekaanshaha Saddexxagalada ku Saabsan

Hordhac:-

Cashirka Waxaad ku bilaabikartaa su.aalo Adoo waydiinaya qeexda su.aalo si Ay u sheegaan qeexda Isu ekaanshaha AFargeeslaha. Taasoo aykubarteen qeybtii hore kadib kudhiirigali inay kashaqeyyaan layliska 4.3 Waad qiimeynkartaa markay kashaqeyyaan.

Sidaad ogtahayba hadii ardaydu aanay sixin cabiraadooda dhererka iyo dhinacyada. Xaglaha ee sadex xagalka sisaxah waxaa lagayabaa in ayna gaadhin gabagabada loo bahanyahey iyadoo kusaleysan kaqeybqaadasha Aqoontooda ee Isku-ekaanshaha AFargeeslaha ee ay qeybtii hore ku barteen. Waydii inay kusiiyaan qeexda Isu-ekaanshaha sadex xagalka-ugu danbeyntii waad uqorikartaa qeexda isu-ekaanshaha sadex-xagalka kawadahadla Tusaalayaasha uu ina siinayo buuga ardayga Adoo raacaya qeexda Isu-ekaanshiyaha sedex- xagalada sidoo kale waxaad kudari kartaa tusaalayaashaada Waydiin inay ardaydu ku siiyaan tusaalayaashooda Ee Isu-ekaanshiyaha sadex Xagalada

Jawaabaha Hawlgal 4.3

1. Hadii si sax ah loo cabiro
 - Saamiga Iskubeeznaanta dhinacyada waxay noqon Iskumid/ wey Isle.ekaan
 - Isku beegnaanta xaglahooda way isku dhigmi doonaan
 - Hadii iskubeeznaanta labadalo, Iskubeeznaanta xaglahoodu iskuma dhigmidoonaan sidookale Iskubeeznaanta dhinacyadoodu kuma siinayaan saami isku mid ah
2. Qeexitaanka isu.ekaanshaha sadex. Xagaladu. Waxa uu sida ugu saxsan lamid yahay qeexda Isu.ekaaashaha shaxanada (waxaad ku-arki qeexitaanka Isu-ekaanshaha sedex-xagalada buuga, ardayga) Kadib kawadahadla tusaalaha waydii ardayda inay ka shaqeyyaan layliska 4.3 fasalka ama guriga ugu danbayntii ka Jawaaba dhamaan su, aalaha
Kadib arday kastaa hakaqeyb qaato jawaabta su,aalaha

Jawaabaha Layliska 4.3

1. Ka sooqaad $\triangle ABC$ udhigmo $\triangle DEF$

Kadib geexda isu-dhignaanta sadex-xagalada Waxaan ognahay in Iskubeeznaanta xaglaha iyo dhinacyaal ay iskudhigmaan. Taasi waxay lamacnotahay

$$\angle A \cong \angle O, \angle B \cong \angle E, \angle C \cong \angle F,$$

$$\overline{AB} \cong \overline{DE}, \overline{BC} \cong \overline{EF}, \text{ iyo } \overline{AC} \cong \overline{DF}$$

$$\text{Waxaan arkaynaa in } \frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = 1$$

Sidaa awgeed $\triangle ABC \sim \triangle DEF$ sida isku beegnaanta Xaglahood ay isugudhigmaan iyo Iskubeeznaanta dhinacyadooda iskudhigmaan, Iskudhigmaan mid mid ah

2. $\triangle ABC$ iyo $\triangle PQR$ sidoo kale wey siman yihiin

- i. $\triangle ABC \sim \triangle DEF \Rightarrow \angle A \cong \angle D, \angle B \cong \angle E, \angle C \cong \angle F$ iyo

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

- ii. $\triangle DEF \sim \triangle PQR \Rightarrow \angle O \cong \angle P, \angle E \cong \angle Q, \angle F \cong \angle R$ iyo

$$\frac{PQ}{DE} = \frac{QR}{EF} = \frac{PR}{DF}$$

Kadib waxaan helaynaa dhameystirka taas oo ah

$$\angle A \cong \angle P, \angle B \cong \angle Q, \text{ iyo } \angle C \cong \angle R$$

Waxaan ar kaynaa intaa waxdheer / taa waxaa siidheer

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} \Rightarrow \frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR}$$

3. $\triangle ABC \sim \triangle DFD$ maxaa yeelay $\angle A \cong \angle E, \angle B \cong \angle F, \angle C \cong \angle D$ iyo

$$\frac{AB}{EF} = \frac{4}{3} = \frac{1}{8}, \frac{BC}{FD} = \frac{3}{6} = \frac{1}{2} \text{ iyo } \frac{AC}{ED} = \frac{5}{10} = \frac{1}{2}$$

4. Isu.ekaanshaha $\triangle PQR$ iyo $\triangle STV$ waxaan helaynaa

$$\frac{PQ}{ST} = \frac{QR}{TV} = \frac{PR}{SV} \Rightarrow \frac{3}{ST} = \frac{5}{TV} = \frac{7}{4} \text{ kadib}$$

$$\frac{3}{ST} = \frac{7}{4} \Rightarrow ST = \frac{3 \times 4}{7} = \frac{12}{7} \text{ iyo } \frac{5}{TV} = \frac{7}{4} \Rightarrow TV = \frac{20}{7}$$

5. Sidaa darteed $\triangle ABC \sim \triangle DEF$, waxaan ogaaneynaa $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

$$\text{Sidaa daraadeed } \frac{AB}{9} = \frac{18}{12} = \frac{AC}{5} \text{ (Iskubadelkaqiimaha-lagusiiyey)}$$

$$\Rightarrow AB = \frac{9 \times 18}{12} = \frac{24}{2} = 13.5 \text{ iyo } AC = \frac{18 \times 15}{12} = \frac{45}{2} = 22.5$$

6. Sidaa dareeded Isu. ekaanshaha laba sadex-xagal waxaan haysanaa

$$\frac{6cm}{t} = \frac{k}{12cm} = \frac{12cm}{16cm} \text{ sidaa darteed}$$

7. Sidaa darteed $\triangle ABC \sim \triangle AQP$ waxaan haleynaa

$$\frac{AB}{AD} = \frac{BC}{QP} = \frac{AC}{AP} \Rightarrow \frac{AB}{3} = \frac{12}{QP} = \frac{9}{4}$$

(Xusuusnow taa $AC = AQ + CQ$)

$$\Rightarrow AB = \frac{27}{4} \text{ iyo } PQ = \frac{48}{9}$$

8. Xusuusashada xaqiiqooyinka kusaabsan shaxanada Afargeeslaha ah, Waxaan ogahey taa

- i. Dhinacyada is ka sohorjeeda ee shaxanada Afargeeslaha ah, ay barbaroyihiin iskunadhigmaan

- ii. Janjeedhkoodu wuxuu goyaa midba midka kale

i.e. O waabadhtanka labada Janjeedh

Sidaa darteed $\angle ABO \cong \angle CDO$ iyo $\angle BAO \cong \angle DCO$

(Xaglo gudeed talantaali ah)

$\angle AOB \cong \angle COD$ (Jooga xaglaha is kasoohorjeeda)

$$\frac{AB}{CD} = 1, \frac{AO}{CO} = 1, \frac{BO}{DO} = 1 \Rightarrow \frac{AB}{CD} = \frac{AO}{CO} = \frac{BO}{DO}$$

Sidaa daraadeed $\triangle AOB \sim \triangle COD$

4.2.2 TiJaabinta Isu ekaanshaha Sadex-Xagalada

Ujeedooyinka mawdacani waa in ardayda la. awoodsiyo inay cadeeyaan sadexda xeer ee aragtiinada (tiJaabo) iyo in ay hubiyaan in laba sadex-xagal ay Isu-egyihiin iyo in kale

buugoodanakagashaqeyyaan/qoraya sadex.xagalka la siiyey laakiin ma'aha buuga ardayda kadib Markay ardaydu dhameeyaan kaqeybqaadashada ugudanbeyn qor dhinac.xagal.dhinac. xeerka isu. ekaanshaha tus ardaydu sidii ay u hubin lahaayeen Isu. ekaanshaha laba sadex.xagal. Adoo Isticmaalaya buuga ardayg a iyo kaaga

Dhandhaarka 3^{aad} Xagal.xagal (AA)

Kaqayb qaadashada 4.6 way kufilan tahay inayfahmaan Ardaydu isku ekaanshaha laba lamaane oo ah xaglo isku began ee laba sadex xagal waa xaalad ku filan isku ekaashaha laba sedex xagal.

Markale kudhiirigali inay kaqaybqaataan ardaydu layliska 4.6 sitaxadarleh koox ahaan amashaqsi ahaan si ayu fahmaan ha ilaawin inay qoraan shaxanada ardaydu

oo ay ku qoraan buugooda oo inay ka qaybqaataan Layliska ugu danbayn u qor iyaga xagal xagal xeerka isku ekaanshaha.

Kadib tus iyaga sida loo isticmaalo laba sadex xagal Adoo isticmaalaya tusaalayaal kala duwan kadibmarkii aycadeeyaan dhinac – dhinac – dhinac, dhinac – xagal – dhinac iyo xagal – xagal ee tijaabada isku ekaanshaha

Dhandharka 1^{aad} Dhinac.Dhinac.Dhinac (SSS)

Dhandhaarka 1^{aad} dhinac – dhinac – dhinac (SSS)

Hadii sadexda dhinac ee sadex xagal ku sargo, anyihiin sadexda dhinac ee sadex.xagal,kale Markaa labadaa sadex.xagal way Iskusargo, an yihiin

Shaqada ardayda 4.4 Waxaanad Kuqancisaa in ay saamiga Iskubeeznaanta dhinacyadooda ee labada sadex.xagal ee ku filan labada sadex xagal Isu.ekaanshiy ahooda Kudhiirigali inay ugashaqeyyaa sitaxadarleh Adoo way neynaya $\triangle ABC$ Adoo Isticmaalaya Cabirsaleedka lagusiiyey Kadib isbarbardhig Iskubeeznaanta xaglahooda cabir ahaan kadib kawadahadla waxaysoobandhigeen kashaqeynta kadib layliska 4.4 Xaalada dhinac, dhinac, dhinac ee tijaabadaaIsu.eknsaha kadib sii Tusalayaal badan buuga ardayga iyo kaaga Ardaydu markay fahmaan dhinac dhinac dhinac ee tijaabadata Isu-ekaanshiyaha waxaad sii wadan kartaa casharka ku xiga ee.

Dhandhaarka 2^{aad} dhinac xagal dhinac

Kaqeybqaadashada 4.5 Waxaykufilantahay fahanka ardayga taas oo ah saami quman labadhinac ee Iskubeezan Iskumadhigman oo AykuJiraan xaglo kufilan xaalada labasadex.xagal.laakin kudhiirigali in ardaydu kashaqeyyaan ama kaqeybqaataan 4.5 koox ahaan ha iloobin inaad usheegto inayKashaqeyyaan laylis 4.5

Jawaabaha Layliska 4.4

1. b. $\triangle PQR \sim \triangle RST$ Maxaayeelay
 $\frac{PQ}{RS} = \frac{2}{4} = \frac{QR}{ST} = \frac{3}{6} = \frac{PR}{RT} = \frac{5}{10}$ iyo Aragtiinka “SSS”
 - t. $\triangle EFG \sim \triangle LMN$ Aragtiinka “SAS”
 Maxaayeelay $\frac{EF}{LM} = \frac{6}{3} = 2, \frac{EG}{MN} = \frac{14}{7} = 2$ iyo
 $\angle EFG \cong \angle LMN$
 - j. Majirto isu.ekaansha. ah sadex-xagalada eeqodobkan
 - k. $\triangle XYZ \sim \triangle TRS$ Aragtiinka “AA”
2. hadiisadex-xagalada siman ee dhamaan dhinacyadoodu leeyilhiin dherer is kumid ah iyo cabirka xagal kasta oo ah 60°

Sidaadaraadeed hadii $\triangle ABC$ uuyahay

Sadex-xagal siman iyo $\triangle DEF$ uu sidookaleyahay

Sadex-xagal siman kadib $\triangle ABC \sim \triangle DEF$

Ee Aragtiinka “AA”/ama “SSS” ama “SAS” tijaabokasta waxaan odhankarnaa $AB = BC = AC$ iyo $DE = EF = DF$ iyo sid oo kale cabirka xagal kasta oo ah 60°

3. Way isku-egyihiin maxaayeelay

$$\frac{AB}{MQ} = \frac{16}{4} = 4, \frac{AC}{MR} = \frac{20}{5} = 4 \text{ iyo xagasha}$$

$\angle A$ iyo $\angle P$ waxay kujireen xag laha

Sidaa Awgeed Aragtiinka “SAS” isu.ekaanshahu tijaabooyinka $\triangle ABC \sim \triangle PQR$

4. Maxaayeelay $\triangle ABC \sim \triangle PQR$ Aragtiin ka “AA” Waxaan helaynaa

$$\frac{AB}{PQ} = \frac{BC}{QR} \Rightarrow \frac{7}{PQ} = \frac{10}{8} \Rightarrow PQ = \frac{56}{10} = 5.6 \text{ iyo}$$

$$\frac{AC}{PR} = \frac{BC}{QR} = \frac{5}{8} = \frac{10}{8} \Rightarrow PR = \frac{40}{10} = 4$$

5. $\triangle APQ \sim \triangle ABC$ ee Aragtiinka maxaayeelay $\angle A$ waa caan $\angle AQP \cong \angle ACB$

6. iyadoo loo eegayo natiijada lagu siiyay Waxaan aragnaa in

$$\frac{RS}{RP} = \frac{RT}{QR} = \frac{3}{4} \text{ iyo } \angle R \text{ waakan Maxaayeelay}$$

- a. $\triangle PQR \sim \triangle STR$ Aragtiinka “SAS”

- b. Sidaadarteed Isu-kaanshaha waxaan haysanaa in

$$\frac{ST}{PQ} = \frac{RS}{RP} \Rightarrow \frac{ST}{32} = \frac{30}{40} \Rightarrow ST = \frac{30 \times 32}{40} = 24$$

7. Sidaa daraadeed Isu ekaanshiyaha $\triangle ABC \sim \triangle DEF$ taas, awgeed waa $\beta \cong \angle E$

iyo $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$ maadaama $\angle APB$ iyo $\angle ODE$ labadooduba waa xaglo quman.

Waxaan helaynaa $\triangle ABQ \sim \triangle DEQ$ aragtinka “ $\angle A$ ” $\Rightarrow \frac{AB}{DE} = \frac{AP}{DQ}$

4.2.3 Wareega iyo bedka Isu-ekaanshiyaha sadex-xagalada

- Ujeedada uguweyn ee cabirkani waa in ardayda loo awoodsiiyo iney shaaca kaqaadaan xidhiidhka kadhaxeeya wareega iyo bedka isu ekaanshaha sadex xagalada.
- Usheeg ardaydu inay kashaqeeyaan tusaalaha 4.7 iyagoo ugashaqeynaya koox koox. Kadib kudhiirigali iney kawadahadlaan fikiradahooda oo ay

ardaydu ay sameeyaan qalad ah dhinaca xisaabinta su, aahaha kadib ugu dabayn xeerka kusaabsan xidhiidhka kadhaxeeya wareega iyo bedka Isu-ekaanshiyaha sadex xagalada. Xeerarkan soosocda u isticmaal tusaalayaal kaladuwan adoo adeegsanaya buuga ardayda iyo kaaga si uukutuso xeerkaloo adeegsado xalinta su, aalaha kadib waydii inay kashaqeeyeen layliska 4.5 sidaas Awgeed kadib waad qiimeyn kartaa waxay kafahmeen cashirka.

Jawaabaha layliska 4.5

1. Saamiga wareegoodu wuxuu lamid yahay isku, beegnaanta dhinacyadooda taas oo ah

$$\frac{10}{5} = \frac{2}{3} \text{ markaa saamiga bedkooduqaatey waa korodh Iskumid ah oo ah}$$

$$\left(\frac{2}{3}\right)^2 = \frac{4}{9}$$

2. Saamigabedfkooda oo ah $\left(\frac{36}{64}\right)$ hadii iskubegnaanta dhinacyadoodu tahay.

Saamiga bedkoodu wuxuuqaadaan korodhiskumid ah k^2 , sidaa awgeed

$$k^2 = \frac{36}{64} \Rightarrow k = \frac{6}{8} = \frac{3}{4}.$$

3. Kasooqaad in dhinaca “A” aytahay sadex-xagalka koowaad “t” aytahay cabirka kadib-dhererka iskubegnaanta saddex-xagal labaad uuyahay 5 e cabbir kadib saamiga iskubegnaanta dhinacyadooda oo sh $\frac{5t}{t} = 5$

Sidaa awgeed saamiga wareegoodu wuxuu ukordhaa si iskumid oo ah “5” saamiga bedkooda oo ah “25”.

4. $\triangle ABC \sim \triangle LMN$ iyo $\frac{AC}{AN} = \frac{11}{15}$

Sidaa daraadeed $\frac{\text{Wareega kore}}{\text{Wareega kore}}$

$$\text{Sidaa daraadeed} = \frac{\text{wareega kore } \triangle ABC}{\text{wareega kore } \triangle LMN} = \frac{11}{15}$$

$$\Rightarrow \frac{44 \text{ cm}}{\text{wareega kore } \triangle LMN} = \frac{11}{15} \Rightarrow \text{wareega kore ee } \triangle LMN$$

$$= \frac{44 \text{ cm} \times 15}{11} = 60 \text{ cm}$$

5. Kasooqaad iskubeeznaanta dhinacyada sadex xagalka labaadyahay S_1, S_2 , iyo S_3 halbeega ugudheer. Wareega kore ee sadex xagalka koowaad oo ah $7+11+6=24$ cm

Kadib saamiga wareegyada oo ah $\frac{24}{72} = \frac{1}{3}$ maadaama saamiga dhinacyada Iskudhigma iyo saamiga wareegooda kore waxaan helaynaa

$$\frac{7}{S_1} = \frac{1}{3} \Rightarrow S_1 = 21 \text{ cm}$$

$$\frac{11}{S_2} = \frac{1}{3} \Rightarrow S_2 = 33 \text{ cm iyo}$$

$$\frac{6}{S_3} = \frac{1}{3} \Rightarrow S_3 = 18 \text{ cm}$$

6. Saamiga iskubeeznaanta oo ah sadex (isba bardhiga ta uguweyn iyo taugugar) kadib saamiga bedkooda oo ah $3^2 = 9$

Hadii bedka sadex xagalka uguweyny ahey “x” waxaan helaynaa

$$\frac{x}{12} = 9 \Rightarrow x = 108 \text{ cm}^2$$

7. Saamiga bedka ΔBQR oo ah $\frac{20}{80} = \frac{1}{4}$ kadib

$$\left(\frac{AB}{BQ}\right) = \frac{1}{4} \Rightarrow \frac{AB}{BQ} = \frac{1}{2} \Rightarrow \frac{6}{BQ} = \frac{1}{2} \Rightarrow BQ = 12$$

Jawaabaha cutubka Afraad (Nakhtiin) ka layliska

1. Kasooqaad in dhinaca labaad ee shangeesoodka / dhinaca shangeesoodka labaadyahay

$S_1=6, S_2, S_3, S_4$ iyo S_5 kadib saamiga dhinac yadooda oo ah $\frac{4}{6}$

$$\text{Sidaadaraadeed } \frac{5}{S_2} = \frac{6}{S_3} = \frac{8}{S_4} = \frac{10}{S_5} = \frac{2}{3}$$

$$\Rightarrow S_2 = \frac{15}{2} = 7.5 \text{ cm}$$

$$S_3 = 9 \text{ cm}$$

$$S_4 = 12 \text{ cm iyo } S_5 = 15 \text{ cm}$$

Sidaadaraadeed shangeesood ka labaad oo ah 6, 7.5, 9, 12 iyo 15 cm oo ugudheer

2. Qaashada saamiga dhinacyada ee $\triangle ABC$ iyo $\triangle DEF$, waxaanhelay naa in

$$\frac{AB}{DE} = \frac{1}{5} \text{ taasoo macnayeheedu yahay}$$

$$DE = 5 (AB)$$

Kadib saamiga wareega kore eeqaatey korodh Iskumid ah kaas oo ay Wada noqondonan $\frac{1}{5}$ iyo saamiga bedkooda ah $\frac{1}{25}$

3. Maadaama laydiga weyni uu u egyahay laydiga lagusiiyey oo ah ABCD waxaan helaynaa saamiga dhinacyadooda oo ah 1.5 taasoo ah hadii laydiga

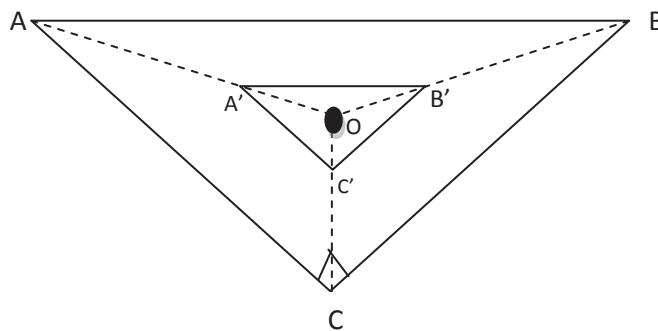
$$\text{wayni ee } A' B' C' D' \text{ waxaan helaynaa } \frac{A'B'}{AB} = \frac{B'C'}{BC} = \frac{A'D'}{AD} = 1.5$$

$$\Rightarrow \frac{A'B'}{4} = 1.5 \Rightarrow A'B' = 6 \text{ iyo } \frac{A'D'}{AD} = 1.5 \Rightarrow \frac{A'D'}{2} = 1.5 \quad A'D' = 3$$

Sidaas daraadeed laydiga uguweyni dhinacyadiisa 3 iyo 6



4. Qaadobarta O dhinaca $\triangle ABC$ iyo \overline{OA} , \overline{OB} iyo \overline{OC} qaadobarta A' , B' , iyo C' sidaas daraadeed $OA = 3(OA')$, $OB = 3(OB')$ iyo $OC = 3(OC')$ kadibna sawir $\triangle A'B'C'$ waxaana loobahanyahay sadex-xagal



8 maxaayeelay $\triangle ECD \sim \triangle EAB$ Aragtiinka “AA”

5. $\frac{EC}{EA} = \frac{ED}{EB} \Rightarrow \frac{EC}{15} = \frac{6}{9} \Rightarrow ec = \frac{15 \times 6}{9} = 10 \text{ CM}$

6. i. $\triangle ABE \sim \triangle DCE$ ee Aragtiinka “AA”

ii. maadaama $\frac{AD}{DC} = \frac{AE}{DE} \Rightarrow \frac{AB}{7} = \frac{2}{4} \Rightarrow AB = \frac{14}{4} \text{ cm}$

7. maadaama $\triangle PTS \sim \triangle PQR$ aragtinka “AA” waxaan helayaaa

$$\frac{PT}{PQ} = \frac{TS}{QR} \Rightarrow QR = \frac{PQ \cdot TS}{PT} = \frac{13 \times 5}{9} = 7.222 \text{ KM}$$

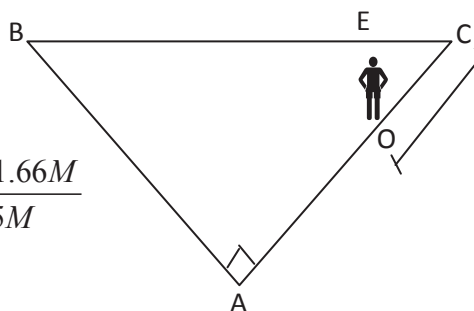
8. Kasooqaad in “AB” inay inasiineyso dhererka cidhifka sidoo kale kasoo qaad in “DE” ay ina tusayso Jooga Aadan marka AC iyo DC aynatusayaan dhererka cidhifyada hoose iyo sida ay ukalahoreeyaan kadib $\triangle ABC \sim \triangle DEC$ Aragtiinka “AA”

$$\Rightarrow \frac{AB}{DE} = \frac{AC}{DC}$$

$$\Rightarrow \frac{AB}{DE} = \frac{AC}{DC}$$

$$\Rightarrow \frac{AB}{1.66} = \frac{9}{2.5} \Rightarrow AB = \frac{9M \times 1.66M}{2.5M}$$

$$\Rightarrow AB = 5.97M$$



i.e. dhererka cidhsiku

Waa 5.97m

9. Kasooqaad in A_1 iyo A_2 aynatusayaan bedka yar iyo bedkaweyn ee sadex xagalka

$$\frac{A_1}{A_2} = \left(\frac{1}{3}\right)^3$$

$$\Rightarrow \frac{A_1}{216} = \frac{1}{9} \Rightarrow A_1 = \frac{216}{9} = 24 \text{ q.cm}$$

10. Kasooqaad $\triangle ABC$ iyo $\triangle DEF$ waa in ayleeyihin sadex xagaladu dherer is kumid ah $\overline{AB} \cong \overline{AC}, \overline{DE} \cong \overline{DF}$ iyo $\angle BAC \cong \angle EDF$

Kadib $\frac{AB}{DE} = \frac{AC}{DF}$ iyo $\angle BAC \cong \angle EDF \Rightarrow \triangle ABC$

$\triangle DEF$ Aragtiinka “SAS”

Ogow $\triangle ABC \sim \triangle DEF$ Aragtiinka “AA”

11. i. Shaxan $\angle C$ waxay caan kutahay $\triangle AEC$ iyo $\triangle BDC$ in taa waxaa dheer labada sadex xagal ee xagasha quman
Sidaadaraadeed $\angle AEC \cong \angle BDC$ labadooduba Waaxaglo quman
Sidaa Awgeed $\triangle AEC \sim \triangle BDC$ Aragtiinka “AA”
- ii. Sadex xagalada BFE iyo AFD Waxaan Aragnaa in $\angle BFE \cong \angle AFD$ sida ayjoog ahaan Ayxaglahoodu isaga soohorJeedaan
Sidookale $\angle BEF \cong \angle ADF$ sida labadooda xaglood ee quman
Sidaa Awgeed $\triangle ABFE \sim \triangle AFD$ Aragtiinka “AA”
12. i. sababtoo ah $\triangle APQ$ iyo $\triangle ABC$ waa xaglo quman Waxayna wadaagaan xagasha “A”
Waxaan Aragnaa in $\triangle ABC \sim \triangle APQ$ Aragtiinka “AA” sidaa Awgeed
$$\frac{AB}{AP} = \frac{BC}{PQ}$$
- ii. hadii aan kuxisaabtano $\triangle APQ$ iyo $\triangle SPC$ waxaan Arkaynaa
a. in labaxaglood oo quman
b. $\angle APQ$ iyo $\angle CPS$ Waa xaglo is buuxsha
Sidookale $\angle CPS$ iyo $\angle CSP$ waaxaglo is buuxsha waxayraacaysaa
 $\angle APQ \cong \angle CSP$ sidaa Awgeed $\triangle APQ \sim \triangle PSC$ Aragtiinka “AA”
$$\Rightarrow \frac{AP}{PC} = \frac{PQ}{SC}$$
- iii. Sidaasookale $\triangle PSC \sim \triangle SRB$ Aragtiinka “AA” Waxayraacaysaa
$$\frac{PC}{SR} = \frac{PS}{SB}$$
13. Maxaayeelay $\overline{PQ} \cong \overline{BC}$ iyo iskubeeznaanta xaglaha iskudhigma
Waxaynaraaceysaa
 $\triangle APQ \sim \triangle ABC$ Aragtiinka “AA”
Kabid $\frac{AQ}{AC} = \frac{PQ}{BC}$
$$\frac{d}{d+t} = \frac{m}{a} \Rightarrow m = \frac{ad}{a+t}$$

CUTUBKA GOOBOOYINKA

HORDHAC

Cutubka waxaa ardayda la barayaa tibxaha gacan goobo, boqon, dhexroor iyo meeriska goobada tusaale waxay fasalkii 7^{aad} ku soo qaateen soo saarista meeriska iyo qaansada goobada.

Hadaba waxay kubilaabi maysaa goobada taasoo kusaabsan Qaansada xudunta xariijin iyo xidhiidka kadhaxeeya goobo iyo xariiq iyo halkay dhacayso xudunta goobadu qaybta labaadna waxay ku baranayayaan xaglaha ku jira goobada, kadib waxay barandoonaa xagalgees iyo xagalxudumeed iyo xaglaha labo meelood ka taabta boqon ka ugudambayna goobada lagu samayn karo afargeeslayaasha.

Barida cutubkana waxay kufilan tahay waxqabadyada loo qoondeeyay mawdnuca waax kast.

Ujeedada cutubka

Ka dib marka uu dhamaado cutub kani ardaydu waxay awood uyeelanayaan:

- inay sifiican, ufahmaan goobada
- waxay garwaaqsanayaan xidhiidhka udhexeeya xariiq iyo goobada.
- Adeegsiga xagal xudumeed iyo xagalgees iyo isbar bardhigida cabirka boqonada isgooya.

Qalabka Kaabayaashe

Kaabayaasha kuu mujinaya sawirada

- Qaansogoobeed, xudun taabte, duse xariiq oo ku dulyaala goobada
- Xagal xudumeed
- Xaglo aysameeyaanboqono is gooya
- Goobo ay ku dhexjiraan afar geeslayaal.

5.1 GOOBOOYIN

Karti

Marka uu dhamaado cutubkani waxay ardaydu karte uyeelanayaa

- *Kalagarashada qaanso yar, iyo qaanso wayn*
- *Kalagarashada xariiq, xariijin iyo fikradahoodaba*
- *Go'aanmin barta xudunta goobadu kaga taalo.*

Hordhac

Qaybta ugu horaysa waxay kusaabsan tahay Naqtiinka, Goobo, Gacan, boqon dhexroor iyo meeriska goobo qaybta ku xigtana waxay ku saabsan tahay kala dheehashada sawirka qaanso yar iyo qaanso wayn ee goobo xariijin iyo xariiq ee goobo taabte iyo dusaha goobo adiga oo isticmaalaya xariiqo aan barbaro ahayn.

- Habka baris la raadin waa in ka doodaan arimahan ardaydu ee meerisyada goobo
- Sidee loo sawariyaa boqon, taabte iyo xariiq Tikraarka
- Sidee loo kala duwayaa qaansada xariiq iyo xariijin
- Sidee loo meelaynayaa xudunta gooboleh boqono isku qotoma oo ka dusa goobada.

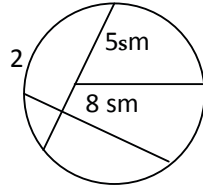
Habka barista

Qoondee naqtiimada goobo, gacan dhexroor, boqon iyo meeriska goobo waxaad ku bilaabi kartaa cashirka waydiimo afka ah ineysawiraan ardaydu goobo dabadeedna ka hubi adigoo koombaas kuhubinaya gacanada.

Su, aalaha 2 iyo 3 way iskudayayaan dhamaan ardaydu, su aalaha labaad u diyaar oo tusto waad waydiin kartaa ardaydu inay kaga dhexshaqeeyaan fasalka su'aasha 3^{aad} waydii ardayda qaarkamid ah inay ka jawaabaan dabadeedna tus sida loo fur furi lahaa adigoohubinaya hawgalka.

Jawaab howlgka 5.1

1. OC waa gacan
2. AB waa dhexroor
3. ED waa boqon



Ogaysii inay suuro gal tahay in lagu sawiri karo boqon kadheer 10 sm

4. Marka hore qor qaacidada lagu helo meeriska goobo $C = 2\pi r$
 - a. $C = 2\pi \text{cm}$
 - b. $C = 5 \pi \text{cm}$
 - c. $C = \frac{7}{11} \pi \text{sm} \approx \frac{7}{11} \times \frac{22}{7} \text{m} \approx 2 \text{sm}$
 - d. $C = 2\pi \left(\frac{1}{\pi}\right) \text{sm} = 2 \text{sm}$

Qaanso yar iyo Qaanso wayn

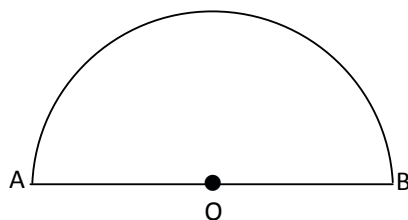
Waad waydiin kartaa ardayda inay sharaxaan sidee A iyo B loogu qaybin karaa goobada shaxan ahaan sidee labadan qaanso la isku barbar dhigi kara, kadooda, qaansoyar iyo qaanso wayn oo gooba sida xaqiiqda Hawlgalka 5.2 looqormeeay go'aami qaanso yar iyo qaanso wayn kuwareeg oo hubi sida ay ardaydu u sawireen qaansada aad waydiisay.

Kadib waydii inay ardaydu kajawaabeen su alihii 2 iyo 3 way karaan in af ahaan uga jawaabaan.

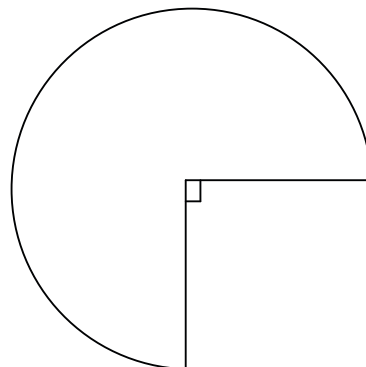
Jawaabah Hawl galka 5.2

1. Qayb Goobeed

b.

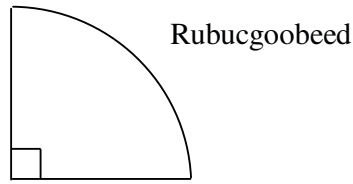


j.



4 meeloodaw 3 goobeed

b.

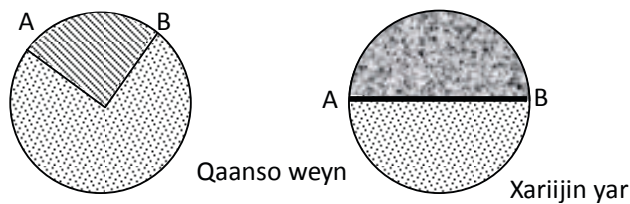


2. Darajada cabirka qaybgoobeed waa 180° darajo cabirka qaansoyar wayka yartahay 180° darajo cabirka qaansowayn waykawayn tahay 180° wayna ka yar tahay 360° qaan yar waa. 180° wayna ka yar tahay 360° .
3. Qaanso wayn iyo Qaanso yarba waxay kamid yihiin \widehat{AXY} , \widehat{XYB} , \widehat{AOQ} , \widehat{BPQ} , \widehat{YBQ} , \widehat{XAP} waxaan odhan karnaa waa qaanso yar “yy” ama waa qanso wayn “yy.” Qaansoyar \widehat{ABQ} , \widehat{AXP} , \widehat{BPX} .

Xariiqo iyo xariijinta goobo

Waxaad kubilaabi kartaa cashirka in aad u sheegto inay kashaqeeyaan hawl galka 5.3 uga samee 2 koobi shaxanka su'aash 1 iyo 2 su aalaha kalana 3 & 4 waxaad u isticmaali kartaan midaba kaladuwan si ay ukala duwanaadaan mid wayn iyo midyar iyo xariiqaha marka ay dhameeyaan ardaydu hawlgalka 5.3 waydii inay qaar kamid ah inay fasalka tusaan adigoosobadhiga xariiqda iyo xariijin adigoo isticmaalaya sabuurada oo aad u isticmaashid tabaashiir kala duwan ugu dambayn uqeeq xariijin.

Jawaabta Hawlgalka 5.3

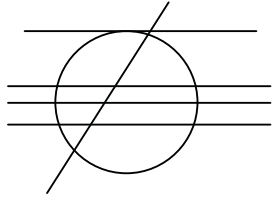


Xariiqyada Tikraarka iyo taabte

Mawduucan waxay ardaydu kubarar doonaan xariiqaha taabte dusaha goobad waxaanad kubilaabi kartaa inay kadoodaan hawlgalka 5.4 si koox koox ah.

Jawaabta hawlgalka 5.4

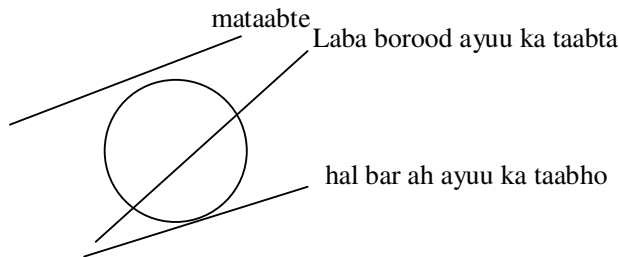
- 1 Xariiq iyo goobada kuwada sawiran shaxan oo aan istaabnayn waana suuro gal inay istaabtaan.



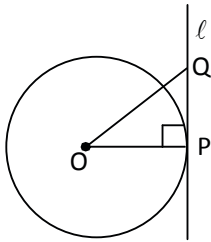
Shaxan 5

Dhamaan xariiqahan way taabtaan goobada

- 2 Ugubadnaan waxaa surogal ah in goobada xariiqdu kataabaato (2) barood.
- 3 Xariiqu goobada ugubadnaan laba barood kataaban karo.



- 4 Guud ahaan ardaydu way yaqaanii sidaloo sawiro xariiqaha qotoma midka sii bar ha isticmaalaan mastarad iyo kombas u cadee in taabtahu kataabto goobada halbar ookali.



Sifudud ayaad ugu sharaxi kartaa in ay tahay taabte goobada (Q) marka $Q \neq P$ kadib $\overline{OQ} \perp \ell$ taas oo ay surogal ahayn inuu saddex xagalyeesho laba xaglood oo cabbirkoodu yahay (90°)

Sidii loo tusi lahaa xudunta goobada iyada oo ladhisayo

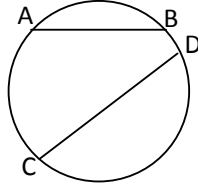
Intaadan siinin hawlgalka 5.5 ardayda, waa in aad daraasaad ku samaysid aqoonta ardaydu ay u leeyihii xidhiidhka kadhaxeeya xariiqaha tikraarka ee badha qaansada iyo xudunta goobada adoo ka anba qaadaya jawaabahooda, ku hag ardayda si ay u fahmaan tikraarka kala badha qaanada ee mara xudunta goobada fiiri jaantuska 5.

Barkasta oo dul taabte \overline{OC} waxay le,egtahay baraha A iyo B taas ayayna ardaydu ku aqoonsankaraan sifudud kadib udir hawlgalada soosocda.

Yoolku: waa inay go,aamiyaan xudun goobo ka samaysan waraaq

Qalabka loo baahan yahay: mastarad, warqad adag, mastarad cabirleh, kombaas iyo maqasyo.

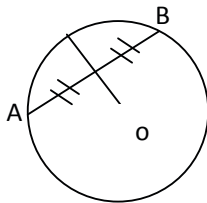
1. Sawir Goobo-gacan keedu yahay 6 sm iyo laba boqon oo aan bar baro ahayn oo dharekooda kala yahay 39 sm iy 4 sm sida ka muuqadada shaxan



2. Kagoo Goobada qaybaha A iyo B sidoo kale hadana kagoo C iyo D mar labaad.
3. Calaamadee barkulanka xariiqaha iyo barta Q.
4. Cabir dhererka AQ, BQ, CQ iyo DQ.
5. Qor weedha Qeexaysa xidhiidhka kedhexeeya barta Q iyo Goobad a habka labaad ee loo meelayn karo xudunta goobada waa laba xoodane oo isku qotoma iyo boqono aan barbaro aheyn.

Marka ay ardaydu dhameeyaan hawl galka 5.5 waydi qaarka mid ah ardayda inay tusaan ardayda shaqadooda fasalka ama ay soo jeediyaan.

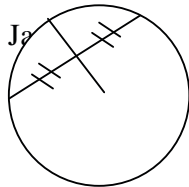
Jawaabaha Hawl galka 5.5



Jaan 5.11

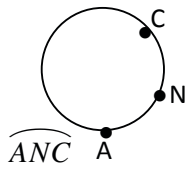
3, $OA = OB = OC = OD = 5$ sm 4 O waxay le'egtahay baraha A. B. C. D hadaba O waa xudunta Goobada dhacdaas waxay kabarandoonaan in barta (O) ayle eg tahay saddexda barood A. B. C hadaba O waa xudunta Goobada ka xoodan A. B. C.

Jawaabta Layliska 5.1

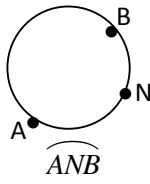


1. b. O waa xudnta
t. AO waa gacan
j. AB waa dhexroor
x. BD waa boqon

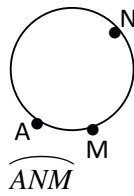
ii. b.



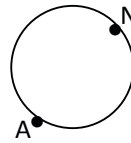
t.



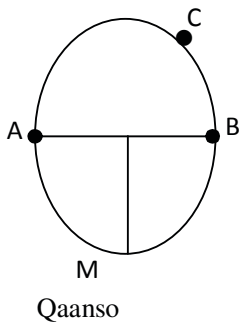
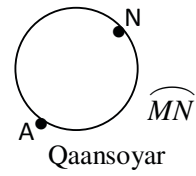
j.



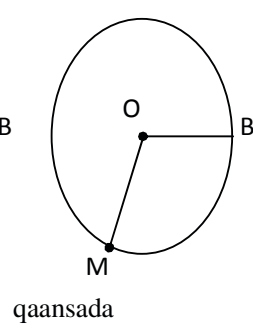
x.



kh.

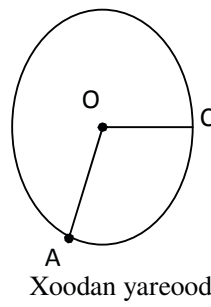


Qaanso



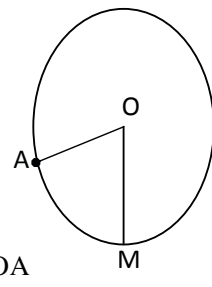
qaansada

xoodan yar eexoodan



Xoodan yareoodan COA

Xoodan wayn oo oodan



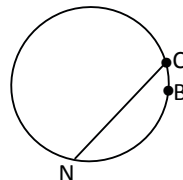
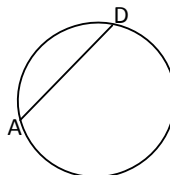
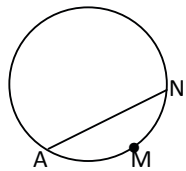
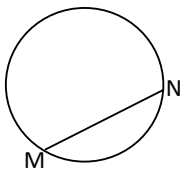
Xoodanyare oodan

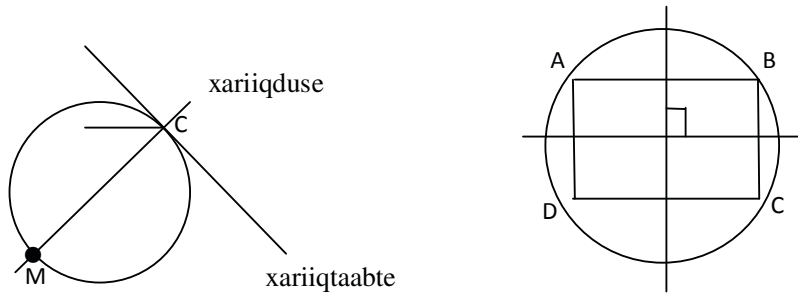
Yar ee BOM weyn BOM

Qeybtahadheysan

Waa Faquuqa yar.

Qeybta aan hadheysnay ni waa faquuqa weyn





\overline{AB} iyo \overline{DC} waabar bar boqono iksu sargo' an \overline{BC} iyo AD waa lamid xariiq ah isku qotoma ee \overline{AB} iyo \overline{BC} waxay ku kul maan xudunta goobadii. Hadii $\overline{AB} \setminus \overline{CD}$ laakiin $AB \neq CD$ wali xariiqaha isku qotoma ee \overline{AB} iyo \overline{BC} waxay ku kulmaan xuddunta goobada.

5.2 XAGALAHA GUDAHA GOOBADA

Tiradi xisadah 20 xusadood

Waxa lagarabo ardyda

Marka uu dhamaado qaybtani waxa ardayda laga rajaynayaa:

- inay kala gartaan xagal xudumeed iyo xagal gees
- furfuri karaan xagal xudumeed iyo xagal gees
- ay cadaynkaraan xagasha ay sameeyaan laba boqon oo kudhex yaala goobada inay le'egtahay badhka taabashad qaansadaa lacabirayo.
- xalin karaan masalooyinka la xidhiidh xaglaha ay sameeyaan isgoynta laba boqon oo kudhexyaal goobadadhexdeeda
- qeexida rubuc goobeedada
- ay tibaaxikaraan astaamaha rubucgoobeedyada
- cadaynta aragtiyada xaglogudeedyada, foosaarka ee rubucgoobeed
- furfuraan xagasha rubuc goobeedka ayna gartaan

Tibxaha furaha u ah xagal xudumeed xagalgees ka qaanso taabtaha.

Rubucgoobeedka.

Hordhac

Qaybtan waxay ardaydu hordhac ahaan uqaadanayaan xidhiidhka ka dhexaya xaglaha iyo cabiridooda. Qaansada iyo goobada waxaan ku bilaabaynaa xagal xudumeed iyo xidhiidhka kadhaxeeya afaarka qaansada iyo xagal geeska kadib iyo xidhiidhka ka dhexeeya xagasha ay sameeyaan isgoynta laba boqon iyo afaarada istaabta ugu dambayn waxay Qeexi doonaan rubuc goobeedyada.

Habka Barida

Waxaan kusoo jeedinay horudhac in qaybtani lagusoo bandhigayo saddax qaybood qaybta hore inay tahay xagal xudumeed iyo xagalgees talabaad xaglaha ay sameeyaan isgoyska boqonadu ee ku dhexyaal goobo qaybta ugu danbaysa rubuc goobeedyadata saddexaad waxaa loo soo jeedin karaa sidan hoos kucad oo ah kala saaridooda.

5.2.1 Xagal xudumeedka & Xagal Geeska

Waxaad kubilaabi kartaa cashirka su'aallaha hawlgalkii 5.5 waxaa laa qooneedyay inlaga caawiyo ardayda garashada xidhiidhka suurogalka ah ee kadhaxeya xaglaha iyo qaybaha Gooboda marka geeska xudunta goobada uu yahay bar kasta oo aan ahayn xudunta iyo Goobada midna.

Soo saar marka hore marka geesku kabaxsan yahay goobada hadaba uqeex xagal xudumeed iyo inay kadoodaan tusaaleyaasha soo socda kahor inta aanad uqeexin xagal gees kudhiiri gali ardaydu inay ka shaqeeyaan hawl galka 5.6 yoolka laga rabo hawlgalka waa in ardaydu ay arkaan in xagal geesyada leh afsaaryo isku mid ah ama qaansooyin isle eg ee goobo in darajada cabirkooduna isle, eg yahay hawlgalkan ha uga shaqeeyaan koox koox ahaan. Ardaydu waxay ubaahan yihiin in laga hubiyo in cabirka xaglahu sax talo bixin kasi ardaydii inay sawiraan goobo wayn ookufilaata si loo cabiri karo xaglaha dhinacyada xagluhu waxay taabtaan cidhifka borotaktarka.

Hawlgalkan kadib (5.6) uqeex ardayda xagalgees hadaba waydii ardayda siday umalaynayaan cabirkeeda iyo xidhiidhka ay leeyihin qaasada afsaarka u ah (daboolqaansedka) iyo in cabbirka xagal xudumeedku inuu lamidyahay qaansada afsaarka u ah ka hor intaa aanad ugu jawaabin udir inay kashaqeeyaan hawlgalka 5.7 kaas oo looqoondeeyay in uu ka caawiyo inay hal abuuran xidhiidhka ka dhexeeya cabir xagal xudumeedka iyo xagalgeeska iyo in xagal xudumeedku le'egyahay qaanso afsaarkeedu. Hawlgalkana ha uga shaqeeyaan si koox kooxyah kadib marka lagadoodo Natijada hawlgalka 5.7 uqor aragtiinka cabbirka xagal geeska sid aad ahna ah ugadoodan tusaalahan soo socda ugu dambayna u dirilayliga 5.2 oo ha kaga shaqeeyaan fasalka ama shaqo Guri kadhig.

Jawaabaha layliska 5.2

1. $m(\angle AOC) = 132^\circ$ iy $m(\angle ABC) = \frac{1}{2}(132) = 66^\circ$
2. $m(\angle POR) = 2m(\angle PQR) = 2(56^\circ) = 112^\circ$ hadaba $m(\angle PR) = 112^\circ$
3. hadaba labada xagalgees ee leh Qaanso afsaar kaliya
 $m(\angle ACB) = m(\angle ADB) = 40^\circ$

4. $\angle BCA$ oo ah xagal gees Qaanso afsaarkeedu yahay goobo badh darajada cabbirkeedu yahay 180° marka $m(\angle BCA) = \frac{1}{2}(180) = 90^\circ$

5.2.2 Xaglaha ay sameeyaan boqono Isgooya

Tus xidhiidhka kadhaxeya xaglaha ay sameeyaan boqonada isgooya ee kudhexjira goobada iyo cabbirka qaansada afsaaradooda udir inay ardaydu ka shaqeeyaan howlgalka 5.8 sitaxdar ah hawlgalkan waxay uga shaqayn karaa midmid ama kooxahaan tooda kadib waxhalabuur nimo ah miyay kaga shaqeyeen hawlgalka 5.8 usheeg ardayda Aragtiinka cabbirka xaglaha ay sameeyaan boqono isgooya ooku dhaxjira goobo inay yihiinbadh qaansooyinka afsaarkooda si aad ah ha uga doodaan Tusaallooyinka kala duwan ee buuga ardayda kuyaala.

5.2.3 Afar gees layaasha wareegsan

Waxaad ku kilaabi kartaa cashirka su aalo inay ka shaqeeyaan Hawlgalka 5.9 waxaan hawlgalkan loo qoondeeyay inuu ka caawiyo ardayda garashada adigoo waydinaya suurtoagal matahay in gooblagu sawir kuwan oo afartooda goobo ay kadusaan, afargeesayaasha lagu siiyey sida barbaroolaha kamid maah laakiin laydigu waa kamid.

Markay ardaydu ka shaqeeyaan hawlgalka 5.9 kadib ka dooda natiijada waad uqeexikartaa afar geeleyaasha wareegsan ardayda ucaadee in afargees layaasha wareegsan aanloo isticmaali karin shaxanada kala duwan sida tusaalayaasha buuga ardayga ku qoran.

Kadib ugudub natijadi hawlgalkii 5.9 ukala dhig dhig Aragtiinka lahaanshaha afar geeslayaash wareegsan waxaana kamid in xaglaha foodsaarka ahi ay is buuxiyaan ee afar geeslaha wareegsan.

Haka doodaan cadaynta aragtiinka aadna ha uga qaybqaataan ardaydu iyagoo adeegsanay aaqoontii ayka heleen xagal geeska, kadib ardayda ku sii laylis iyagoo isticmalaya tusaallooyi kala duwan oo u gaar ah iyaga oo ku jiran kuwa buug ardayga.

Hawlgalka 5.8

1. 180°
2. 360°
3. Haddii cabbiraada loo sameeyo si sax ah, waxaa la heli doonaa in $m(\angle DAB) + m(\angle BCD) = m(\angle CDA) + m(\angle ABC)$ markay ardydu qabtaan hawlgalka 5.8 ee ay ka doodaan maxsuulka, waadu qeexi kartaa afargeeslaha goobada ku dhaxjira (meersan), Ardaydu hana kala saaraan afargeeslaha

goobada ku dhexjira (meersan) iyo ka aan ku dhexjirin (Meersanayn) iyagoo isticmaalaya jaantusyo kala duwan oo ay ku jiraan tusaaleyaasha buugga ardyga ku jiraa. Adigoo ku salaynaya maxsuulka ay ka heleen hawlgalka 5.8 sheeg Aragtiinka astaamaha afargeeslaha ku dhexjira goobada (meersan).

Taasoo ah “xaglaha iska soo horjeeda ee afargeeslaha meersani waa xaglo is dhammaystira”

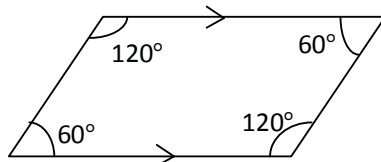
Dabadeed ka dooda caddaynta aragtiinkan iyagoo ardaydu aad uga qeybgalaya, iyagoo isticmaalaya aqoontoodii hore ee xaglaha goobada ku dhexjira.

Dabadeed, Ardayda sii laylis ay u isticmaalaan aragtiinka, adigoo isticmaalaya tusaaleyaal kala duwan oo aad adigu samaysatay iyo tusaaleyaasha ku yaala buugga ardayga ee ku xigga aragtiinka.

Jawaaba Layliska 5.3

- 1) $m(\angle CPB) = \frac{1}{2}m(\widehat{CB}) + (m(\widehat{AD})) = \frac{1}{2}(100 + 70) = 85^\circ$ iyo $m(\angle APB) = 180^\circ - m(\angle CPB) = 180 - 85 = 95$
- 2) $m(\angle AED) = \frac{1}{2}(m(\widehat{DA})) \Rightarrow 95 = \frac{1}{2}(83 + m(\widehat{DA})) \Rightarrow m(\widehat{DA}) = (2 \times 95) - 83 = 107^\circ$
- 3) $m(\angle PYM) = 180^\circ - 70^\circ = 110^\circ$ kabadan $m(\angle TPY) + m(\angle TMY) = 180^\circ$
- 4) Afargeelayaasha t iyo j waa kuwo meersan laakin afargeeslahya Q ma'aha.
- 5) B run t run j been waxay xaglaha iska soo horjeedaa Barbaro ah qasab ma ah inay isbuuxshaan.

Fiiri Tusaallhan soosocda



$$60^\circ + 60^\circ = 120^\circ$$

$$\text{Sidookale } 120^\circ + 120^\circ = 240^\circ$$

Jawaabaha Nakhtiinka layliska Cutubka 5^{aad}

1. Su'aalaha 1b, 1t, iyo 1j, ee xudunta goobad, waa barta ay iska jaraan xarii qaha isku qotoma ee lagu siiyey boqonada aan bar-baraha aheyn su'aasha 1j, boqonada lagu sii'yey ee \overline{AB} iyo \overline{CD} waa bar-baro maadaama oo ay ardaydu waa ineysawiraan \overline{AC} iyo \overline{BD} ama barta ay iska jaraan lammaanaha \overline{AB} iyo \overline{BD} ama \overline{AB} iyo \overline{AC} ama labada midkood \overline{AC} iyo \overline{CD} ama \overline{CD} iyo \overline{BD} ee lagu siiyey xudunta.
2. $m(\angle ABC) = \frac{1}{2}m(\angle AOC) = \frac{1}{2}(140^\circ) = 70^\circ$ iyo $m(\widehat{ADC}) = m(\angle AOC) = 140^\circ$
3. $m(\angle CBA) = \frac{1}{2}m(\text{inta yar qaansada CA}) = \frac{1}{2}m(\angle AOC) = 40^\circ$
4. Samee dhexroorka \overline{AD} , aan kusoo aragney (inta yar ee qaansada BD) = 2, $m(\widehat{BAO}) = 50^\circ$ markaa $m(\widehat{ACB}) = 180^\circ - 50^\circ = 130^\circ$
5. Waxanynu garaney naa $m(\angle BPD) = \frac{1}{2}[m(\widehat{BED}) + m(\widehat{AFC})]$ markaa
 $75^\circ = \frac{1}{2}[110^\circ + m(\widehat{AFC})] \Rightarrow m(\widehat{AFC}) = 150^\circ - 110^\circ = 40^\circ$
6. Maxaa yeeley \overline{AB} waa dhexroorka iyo $m(\widehat{ADB}) = 180^\circ$ waxaan raadiney naa $m(\text{inta yar ee qaansada DB}) = 180^\circ - 40^\circ = 140^\circ$ haddii aynu u eego sikale:
 $m(\angle DPB) = \frac{1}{2}[m(\text{inta yar ee qaansada DB}) + m(\widehat{CYA})]$
 $\Rightarrow 130^\circ = \frac{1}{2}[140^\circ + m(\widehat{CYA})] \Rightarrow m(\widehat{CYA}) = 260^\circ - 140^\circ = 120^\circ$
7. $m(\angle D) = \frac{1}{2}m(\widehat{ABC}) = 70^\circ$ maxaa yeelay $m(\angle A) = 80^\circ$ iyo $m(\angle A) + m(\angle C) = 180^\circ$ waxay nu helaynaa $m(\angle C) = 180^\circ - 80^\circ = 100^\circ$ xusuus: xaglaha iska horjeedaa ee afargeesluhu waa xaglo isbuuxsha.
8. $m(\angle APC) = \frac{1}{2}[m(\text{inta yar ee qaansada DB}) + m(\text{inta yar qaansada ee CA})]$
 $90^\circ = \frac{1}{2}[60^\circ + m(\text{inta yar ee qaansada CA})]$
 $\Rightarrow m(\text{inta yar (CA)}) = 180^\circ - 60^\circ = 120^\circ$
 Sidaas darteed $m(\angle ABC) = \frac{1}{2}m(\text{inta yar ee CA}) = 60^\circ$

CUTTUBKA ITMAALKA

HORDHACAS

Ujeedada ugu muhiimsan ee cutubkani waa in ardayda labaro qeayb ka midaa qaybaha xisaabta ee la isticmaalo taas oo ah itmaalka. Itmaalka waxaa loo isticmaalaa waxyaalo fara badan oo ay ka mid yihiin fiisigiska kimistariga, baayolojia, saykolojia waxbarasaada dhaqaalaha, ganacsiga, warsadaha, dhismayaasha sidaas daraateed waa in ardayda labaro itmaalka ardaydu waxay si faahfaahsaan ugu baran doonaan itmaalk fasalka 9^{aad}.

Cutubkani wuxuu ka kooban yahay laba qaybood. Qaybta koowaad waa fikradaha itmaalka sida dhacdooyinka suurtagalka ah iyo kuwa aan suurtagalka aan aheyn. Qeybta labaadna waa qeexiitaan dhacdooyinka caadiga ah iyo tusaalayaal farabadan oo laxidhiidha ixtimaal iyo dhacdooyinka caadi ga ah. Ardayda ku dhiirigali siday qaban lahaayeen koox-koox, hawlgalka, iyo layliska lamaaneyaal ahaanyah waxaad kula talisaa in koox-kooxdu ay fiican tahay maxaa yeelay waxay ardayda ku abuuraysaa kal sooni, sidoo kale waxay sicad uqeexi karaan fikradahooda sixor ah waxaa kale oo ay ardayda ku abuuri tartan dhexdooda ah.

Hadaba ardaydu waa inay koox-koox uqabtaan hawlgalada soo socda, kuwan oo ah ujeedooyinka guud ee waxbarashadada.

Ujeedooyinka cutubka

Cutubkani marka uu dhamaado ardaydu waxay awood uyeelan doonaan:

- *Inay fahmaan natiijooyinka fikradaha hubaalka, kuwa aan hubaalka aan ahayn iyo kuwa aan suurtagalka ahayn.*
- *Garashada xaqiiqooyinka dhabta ah ee kusaabsan dhacdooyinka, ururka itmaalka iyo ixtimaalka dhacdooyinka caadiga ah.*

Qalabka barista loo doorbiday

Buuga ardayda iyo kamacalinka waxa kuudheear oo lagaaga baahan yahay inaad u adeegsatid cutubkan waa laadhu ka sameysan loox, taas oo laga heli karo agagaarkadugsiga, qadaadiic, wareejiye ka sameysan qalabka laga helo agagaarka dugsiga.

6.1 FIKRADAHA ITMAALKA

Wakhtiga looqoondeeyey: 5 xiso

Waxa ardayda laga rabo

Marka uu cutubhoosaadkani dhamado ardaydu waxay awoodi doonaan:

- inay ka lasaaraan natiijooyinka hubaalka ah iyo kuwa aan suurta galka aheyn.

Hordhac

Khibradaha nolol maalmeed keena waxaan lakulanaa natiijooyin kala duwan, qaarkamida natiijooyinka waa hubaal inay dhacaan, natiijooyinka noocan ahna waxaa loo yaqaanaa natiijooyin hubaal ah. Sidoo kale waxaa jira natiijooyinka qaarkamida inaaney hubaal aheyn inay dhacaan laakiin ay suurtagal tahay inay dhacaan.

Natiijooyinka noocan ahna waxaa loo yaqaanaa

Natiijooyinka suurtagalka ah, waxaa kaloojira natiijooyinka qaarkood inaan hubno ineyna dhicikarin, natiijooyinka noocan ahna waxaa looyaqaanaa natiijaayin aan suurtagal ahyn ama aan dhici Karin. Hadaba qeybtan waxaa lagaa rabaa inaad ardayda bartid natiijooyinkan.

Habka barista

Waxaad qeybtan ku bilaabi kartaa inaad ardayda ii sdi tusaalayaal kaladuwan oo khibradaha nolol maalmeedka ah, waxaad isticmaali kartaa tusaale 1 iyo hawlgalka 6.1 ee buuga ardayga.

Kacaawi ardayda siday u kala soocilahaayeen natiijooyinka, iney yihiin, kuwo hubaal ah, kuwo suurtagal ah, iyo kuwo aan suurtagal aheyn.

Jawaabaha Hawlgalka 6.1

1. 3 iyo 6
2. 1, 2, 4 iyo 5.

Jawaabaha shaqo kooxeedka 6.1

Ujeedada shaqo kooxeedkani waa in aad ardayda bartid fikradaha ku saabsan dhacdooyinka hubaalka ah, kuwa suurto galka ah iyo kuwa aan suurto galka aheyn.

- J. Tirada 8 kamamuuqan karto dusha laadhuda maxaayeelay laadhud dusheedu waxaa ku qoran tirooyinka 1 ilaa 6.
- x. Haddii aad tuurtid laadhu ay ku qoran tahay tirooyinka 1 ilaa 6 natiijooyin ka suurtagalka ah ee ka soo bixikaraa midkamida tirooyinka kuqoran ee 1 ilaa 6, sidaas darteed waxaad hubtaa inuu soo muuqan midkamida tirooyinkan.
- Kh. Waxaa suurto gal ah inuu soomuuqo tirada 3 maxaayeelay waa mid kamida tirooyinka laadhuda.

Qiimeynta

Waxaad isticmaali kar kartaa layliska 6.1 si, aad u qiimeyso ardaydu inay fahmeen fikradaha ay ku soo barten qeybtan kuwan oo kala ah hubaal suurto gal, aansuurto gal ahayn.

Jawaabaha layliska 6.1

1. Jawaabaha su'aalaha, waa
 - b. Been, maxaayeelay ilmuhu kama weynaan karo hooyadii.
 - t. Run, waxaad soo baratey taranta laba jibaar qumani inay tahay laba jibaar quman.
 - j. Run iyo Been midna ma'aha.
 - x. Run, maxaayeley waxaan naqaan baayolajiga.
2. Halka waxaan ku aragnaa labashay, kahore haddii aan tuuro caanteyn, durama daabac ayuunbaa muuqan, kalabaad haddii aad tuurtid laahu waxaa muuqan kara tirooyinka 1 ilaa 6.
 - b. Natiijo suurto gal ah
 - t. Natiijo aan suurto gal aheyn.
 - j. natiijo hubaal ah
3. Waree jiyaha lagu siiyey wuxuu kakooban yahay 5 qeybood. 1 ilaa 5 ayaa ku qoran, oo midabo kala duwan oo kala, cadaan, huruud buluug, cagaar, iyo casaan siday u kala horeeyan
 - b. inuu soo dago qeybta buluugu waa suurto gal maadaama oo buluugu yahay midka mida midabada lagusiiyey.
 - t. Soodegitaan ka qeybta cas, waa suurto gal, maadaama casaan kamid yahay midabada lagu siiyey.
 - j. inuu soodego midabka basaligu ma, aha suurto gal sababtoo ah, midabkani ma, aha midabada lagu siiyey.

- x. inuu soo dego midkamida midabada la ina siiyey oo ah cadaan huruud, buluug, cagaar, iyo casaan waa suurtoagal, maadaama oo ay yihiin midabada la ina siiyey, waxayna noqon kartaa hubaal.
- Kh. inuu soo dego buluug iyo 5, waa ntiiyo aan suurtoagal aan aheyn maadaama oo ayna qaybta buluuga aah aaney ku qorayn tirade 5.
- d. iney soodegaan cadaan iyo 5 waa suurtoagal. Maadaama cadaan ku yahay mid kamida qeybaha midabada la ina siiyey.
- r. maadaama dhamaan qeybaha ay ku qoran yihiin tirooyinka 1 ilaa 5, iney soo degaan tirooyinka 1 ilaa 5 waa natiijo hubaal ah.
4. Marka aad laadhu tuurtid 4 jeer midka mida tirooyinka 1 ilaa 6 ayaa muuqan kara halkii marba, tirada ugu badan ee muuqankarta marka laadhuda latuuro hadii ay tahay 6 waa imisa muuqasha tirada wadarta natiijada suurtagalka ahi waa $4 \times 6 = 24$, haddii 6 muuqato tuuritaan kasta
- Natiijada aad ku heli kartid wadarta tirooyinka iney noqoto 25 waa mid aan suurtoagal aheyn
- b. Dhamaan tirooyinka muuqan marka latuuro 4 jeer, waxay dhici karaan marka dhamaan tirooyinka ay muuqdaan 5. Tan'waa dhacdo suurto gal ah.
- t. Tirada u yaraan muuqan karta tuuridkasta waa 1 hadaba marka la tuuro 4 jeer wadarta uyar ee tirooyinku waa 4, tan oo kaweyn 3. Sidaas darted dhacdadani waa mid hubaal ah.

6.2 Itmaalka waqdhacyada fudud

Wakhtiga: 10 Xiisadasa

Waxa lagarabo ardayda

Marka uu dhamaado cutub hoosaadkani ardayduwaxay awood u yeelan karaan

- *inay caddeeyaan tijaabooyinka, dhacdooyinka iyo ururka itmaalka*
- *inay Go'aamiyaan Ixtixmaal dhacdooyinka caadiga, ah.*
- *Inay qeexaan itmaalka iyaga oo isticmaalaya jajabyada, jajabtoban layaasha iyo boqoydaa.*

Hordhac

Ujeedadan muhiimsan ee qeybtani waxay tahay in ardayda labaro tibxahan:-

Tijaabo, ururka itmaalka, dhacdada iyo itmaalka dhacda'da, sidoo kale ardayda waa in laga caawiyo siday ururin lahaayeen natiijooyin ay ku soo arkeen qeybtii hore, kuwaa oo u dhexeeyey "0" iyo "1".

Tan waxaanu qeexidoonaa kadib markaan qeexno, itmaalka dhac doo yinka.

Habka barista

Kadib markaad u nakhtiintid qeybtii hore Ardayda waxaad ka caawisaa siday ugashaqeyn lahaayeen shaqo kooxeed ka 6.2. Kan oo ka caawinaya qeexitaanka tijaabooyinka, kadibna waxaad siisaa tusaalayaal kale duwan.

Waxaad adeegsan kartaa tusaalaha 2^{aad} ee buuga ardayga oo kacaawinaya arintan.

Sidoo kale ardayda waxaad ka caawisaa kashaqaynta hawlgalka 6.1. Kadibna ardayda waxay arki doonaan in dhamaan natiijooyinka suurtagalka ah ee muuqan kara marka caantayn latuuro, iney yihiin {daabac, dur} iyo in natiijooyinka muuqan kara marka laadhu latuuro iney yihiin {1, 2, 3, 4, 5, 6}. Tana waxay inagacaawindoonta inaan qeexno ururka ixtimaalka tijaabooyinka.

Intaa kabacdi waxaad firisaa Hawlgalka 6.2 oo ardayda kacaawi inaad tustid iney jiraan hormo ururada ururka ixtimaalka ee tijaabooyinka, tana waxaykaa caawin inaad qeexid tijaabada dhacda'da.

Ardayda waxaad uga shaqeysaa tusaaleyaasha kala duwan oo kuyaala buuga ardaydga, Tusale 6 waa inaad kacaawisid oo aaney ardydu ku wareerin fikrada urur. Erayga MATTER, waxaa kujira laba "T" ururkuna waa $\{T.T\} = \{T\}$

Laakiin dhacda'da $\{T.T\}$ waxay kakooban tahay T.

Maadaama oo ayjiraan 2 kaar oo ay kuqoran yihiin xarafka T. marka $\{T\}$ waxay ka kooban tahay "T" kaliya.

Tusaalaha 5 iyo tusaalaha 6 ee buuga ardaygu waxay u habaysan yihiin, siday ardaydu ugu diyaar garoobi lahaayeen ama ardaydu isugu diyaarin lahaayeen qeexitaan dhacda'da ixtimaalka.

Sidoo kale ardayda waa inaad siisaa tusaalyaaa'faranbadan oo kacaawiya muujinta fikradan tana waxaa ka caawinaya tusaalaha 7 iyo tusaalaha 8 ee buuga ardayga.

Hadda waxaad ardayda u sheegtaa in ixtimaalka loo qeexikaro jajab ahaan, jajab tobanle ahaan, iyo boqoleyba Adigoo isticmaalaya hawlgalka 6.5, ardayda waxaad u tilmaantaa siday ugu soo gabagabeyn lahaayeen in ixtimaalka dhacdooyinku inuu udhexeeyo "0" iyo "1".

Adiga oo xooga saaraya in dhacdada'ixtimaa ka aan suurtoogalka aheyni iney tahay "0".

Dhacda'da itmaalka ee hubaalka ahina iney tahey "1".

Qiimeyn

Ardayda waxaad ku qiimeyn kartaa inaad siisid, shaqo guri, shaqo fasal iyo inaad hubisid buugaagtooda qoraalka.

Waxaadnad adeegsan kartaa Laylis 6.2 ama waxaad u soo xuli kartaa su'aalaha nakhtiinka leylis. Maadaama oo ay qeybtani ay tahay qeybta ugu danbeysa cutubka waxaakaloo aad siin kartaa leylisyo kale.

Jawaabaha Shaqo Kooxeedka 6.2

Ujeedada ugu muhiimsan ee shaqo kooxeedkani waa siday ardaydu u diyaarin lahaayeen siday u qeexilahaayeen tijaabada iyo tijaabada bakhtiyaa nasiibka ah.

Sidaas darted ardayda waa inaad u tilmaan taa iney ku falanqeeyaan shaqo kooxeedkan kadibna waxaad uqeexdaa tijaabada iyo tijaabada bakhtiyaanasiib ka ah.

Ardaydu waa iney gartaan koox kasta iney heli karaan natiijooyinka la duwan. Sidoo kale waa inaad uqeexdaa iskudaygu waxa uu yahay sida tijaabada bakhtiyaanasiibka'ah ee waxqabadka gaar ahaaneed.

Tusaale ahaan: tuurida caanteyn 10 jeer waa tijaabo bakh tiyaanasiib ah.

Tuurida caanteyn kala tuuro halmar waa iskudayid.

Jawaabtaha Hawlgalka 6.1

Habka barista:- sida shaqo kooxeed ka 6.1. Jawaabaha su'aalahan way ku kala duwanaan karaan ardaydu. Laakiin ujeeda ugu muhiimsan ee hawlgalkani waa siday ardaydu u muujin lahaayeen.

Natiijooyinka suurtoogalka ah ee

1. Haddii latuuro shilin waxaa laheli karaa daabac ama dur.
2. Haddii la tuuro laadhu waxaa laheli karaa:- midkamida tirooyin ka udhexeeya 1 ilaa 6.

Markaa waxaad ardayda uqeexi kartaa ururka ixtimaalka adigoo isticmaalaya tusaale yaal kala duwan sidii aad uxoojin lahayd fahanka ardayda ee ku saabsan ururka ixtimaalka sida kuwa lagugu siijey buuga ardyga.

Jawaabaha Hawlgalka 6.2

Hawlgalkan wuxuu u habeysan yahay siday arday u he li lahaayeen fikradaha ku saabsan hormoururka, ururka ixtimaalka sidaas darted waxay u diyaargaroobanayaan qeexitaanka dhacdooyinka.

1. Tani waa tijaabo tuurita ncaanteyn
 - b. ururka dhamaan natiijooyinka suurtoogalka ah waa = {Daabac, Dur}.
 - t. dhamaan hormo ururka urur ka ixtimaalku waa ϕ , {Daabac}, {Dur}, iyo {daabac, Dur}
2. Haddii laadhu la tuuro hal mar
 - b. urur ka dhamaan natiijooyinka suurtoogalka ah waa:- {1, 2, 3, 4, 5, 6}.
 - t. ururka tirooyin kadhawan ka ahi waa = {2, 4, 6}
 - j. ururka tirooyin ka mutuxan waa = {2, 3, 5}
 - x. majirto tiro udhaxessa 1 ilaa 6 oo u qeyb santa 7, sidaas darted ururkani waa urur madhan ϕ .
3. Su'aalaha 1 iyo 2 ee kor kuxusan Natiijooyin ka suurtoogalka ah ee tijaabadu waa; hormo ururka ururka ixtimaalka ee tijaabada.

Jawaabaha Hawlgalka 6.3

Ujeedada ugu muhiimsan ee hawlgalkani waa sidii ardayda looga caawin lahaa siday u arki lahaayeen in ixtimaalka dhacdooyin ku badanaa udhexeeyo:- “0” iyo “1” marka laga shaqeeyo hawlgalkan Ardayda ka caawi iney ku soo gabagabeeyaan in ixtimaalka dhacdooyinku udhexeeyo “0” iyo “1”.

1. Tijaabada tuurida caanteyn ka ururka ixtimaalku waa (Daabac iyo dur).
2. Haa, ururka ixtimaalku waa dhacdo maadaama oo uu hormo urur isu yahay lafahaantiisu.

Sidaas darted, ixtimaalka, ururka ixtimaalku waa $\frac{2}{2} = 1$
3. Laadhuda waxaa ku qoran tirooyinka 1, 2, 3, 4, 5 iyo 6.

Sidaas darted helida dhacdata tiro kaweyn 7, waa urur madhan.

Ixtimaalkeeduna waa $\frac{0}{6} = 0$
4. Tirooyinka dhabanka ah ee udhexeeya 1 iyo 6 waa 2, 4 iyo 6.

Sidaas darted helida dhacda'da tirooyinka dhabanka ah waa = {2, 4, 6}.

Ixtimaalkeeduna waa $\frac{3}{6} = 0.5$
5. Su, aalaha 1 – 4, waxaad ku soo aragtey in ixtimaalka dhacdooyinku u dhaxeeyo “0” iyo “1”.

Ardayda fahan koodu aad u sareeyo waxaad siin kartaa layliskan soosocda. Dad tiradoodu dhan tahay 40, ayaa 10 kamid ahi ay caafimaadqabaan, 30 ka soo hadheyna waxay qabaan dhiig kar iyo macaan labadaba. Haddii 15 ay qabaan dhiig kar. 25 ay qabaan macaan.

- b. Dad inteedhan ayaa qaba dhiigkar iyo macaan? Haddii qof looga doorto si bakhtiyaa na siibah, kooxdan? Waa imisa ixtimaalkiisuna?
- t. Dhiig kar
- j. Macaan
- x. Dhiigkar iyo macaan labadaba?
- Kh. Dhiig kar iyo macaan midna labada aan laheyn?

Furfuris

Hadaba waa iney isticmaalaan aqoontooda kusaabsan ururada:-

- b. uqaado x iney tahay ama u taagantahay dadka qaba dhiigkartka iyo macaanka, markaa:- $30 = 15 + 25 - x$, markaa $x = 10$
- t. ixtimaalka qof looga doortey si bakhtiyaana siibadadka qaba dhiig karku waa $\frac{15}{40} = \frac{3}{8}$.
- j. ixtimaalka qof looga doortey si bakhtiyaanasiib, ah dadka qaba macaanka waa $\frac{25}{40} = \frac{5}{8}$.
- x. ixtimaalka bakhtiyaanasiibka ah ee looga doortey dadka qaba dhiig karka ama macaanku waa $\frac{10}{40} = \frac{1}{4}$.
- kh. ixtimaal bakhtiyaanasiib ka ee looga doortey dadka aan qabin dhiigkarka iyo macaantoona waa $\frac{30}{40} = \frac{3}{4}$.

Jawaabaha Leyliska 6.2

1. Tijaabadu waa qadaadiic latuuray 4 jeer, markaa ururka ixtimaalku waa $S = \{ \text{Da Da Da, Da Da Da Du, Da Da Du Da, Da Da Du Du, Da Du Da Da, Da Du Da Du, Da Du Du Da, Da Du Du Du, Du Da Da Da, Du Da Da Du, Du Da Du Da, Du Da Du Du, Du Du Da Da, Du Du Da Du, Du Du Du Da, Du Du Du Du} \}$.
2. Waxaad isticmaalikartaa seddex shaxan si aad uraadisid ururka ixtimaalka.
 - b. Helida dhacda'da dhabta ah ee labo daabac waa:-
Waa {Da Da, Du Du, Da Du, Da Du, Da Du, Du Da, Du Da, Da Du, Du Da, Du Da, Du Du, Da Da}
 - Markaa ixtixmaalku waa $\frac{\cancel{6}}{\cancel{16}} = \frac{3}{8}$.

- t. Helida dhacda'da ugu yaraan daabacu soo muuqanayaa waa:-
 {Da Da, Du Du, Da Du, Da Du, Da Du, Du Da, Du Da, Da Du, Du Da,
 Du Da, Du Du, Da Da, Da Du, Da Da, Da Du, Da Da, Da Du, Da Da,
 Du Da} ixtimaalkuna waa
 $\frac{14}{16}$.
- j. helida dhacda'ad 3 daabac waa:-
 {Da Da, Da Du, Da Da, Du Da, Da Du, Da Da, Du Du, Du Da}
 Markaa ixtimaalkiisu waa: $\frac{5}{16}$.
3. Haddii aad tuurtid laba laadhuyood. Markaa ururka dhacda'du waa:-
 {{1, 1}, {1, 2}, {1, 3}, {1, 4}, {1, 5}, {1, 6}, {2, 1}, {2, 2}, {2, 3}, {2, 4},
 {2, 5}, {2, 6}, {3, 1}, {3, 2}, {3, 3}, {3, 4}, {3, 5}, {3, 6}, {4, 1}, {4, 2}, {4,
 3}, {4, 4}, {4, 5}, {4, 6}, {5, 1}, {5, 2}, {5, 3}, {5, 4}, {5, 5}, {5, 6}, {6, 1},
 {6, 2}, {6, 3}, {6, 4}, {6, 5}, {6, 6}}
- b. wadarta dhacdada tirooyinka 3 waa:
 {{1, 2}, {2, 1}}.
- Ixtimaalka dhacdacduna waa $\frac{2}{36} = \frac{1}{18}$.
- t. wadarta dhacda'da tirooyinkua 3 waa: {{6, 6}}.
- Ixtimaalka dhacda'duna waa: $\frac{1}{36}$.
4. Waxaa jira afarta qof oo katirsan ururka "Equb" Haddii 15 xubnood oo katir
 san ururka "Equb" inay guuleysteen, markaa waxaa soo hadhay 25 xubnoo oo
 ay hooyadaa xubin ka tahay.
 Sidaas darted, ixtimaalka, ay hooyadaa ku guuleysaney saneyso waa $\frac{1}{15}$.
5. Ururka ixtimaalku waa {Huruud, buluug, cagaar, casaan}.
- b. Fursada uu ku soo dagayo buluugu waa $\frac{1}{4}$ markaa ururka dhacda'du
 waa {buluug}.
- t. Fursada uu ku soo dagayo casaan ku waa $\frac{1}{4}$, markaa ururka dhac'dadu
 waa:- {casaan}.

Jawaabaha Nakatiinka layliska

1. Ururka ixtimaalku waa {Da, Da, Da, Du, Du, Da, Du, Du}.
- b. Helida dhacda'da Daabac Daabac, waa {Da, Da ixtimaalkiisuna waa $\frac{1}{4}$

- t. {Da, Du, Du, Da} waa dhacda'da "b" ixtimaalka helida daabac iyo dur
waa $\frac{2}{4} = \frac{1}{2}$.
- j. Helida dhac'da'da Dur, Dur waa {Dur, Dur,} ixtimaalkeedu, waa $\frac{1}{4}$.
2. Ururka ixtimaalku waa {1, 2, 3, 4, 5, 6}.
- b. {1, 3, 5} waa dhacdada helida tirooyinka kisiga ah, ixtimaalkooduna
waa $\frac{3}{6} = \frac{1}{2}$.
- j. Tirooyinka kayar 6 waa 1, 2, 3, 4 iyo 5 sidaas darteed ixtimaalka heli
tiro kayar 6 waa $\frac{5}{6}$.
3. tijaabo bakhtiyaa nasiib ah
4. Wuxuu udhexeeya "0" iyo "1"?
5. b. Natiijo aan suur to gal aheyn iney dhacdo
t. Natiijo suur to gal ah iney dhacdo
j. Natiijo hubaal ah iney dhacdo.
6. Erayga MATHEMATICS, Waxaa kujira 11. Alifbeeto sidaas darted. Ururka
ixtimaalku waa {M, A, T, H, E, M, A, T, I, C, S}
- b. Waxaa ku jira 4 shaqal oo kala ah. A, E, A1, iyo I, markaa ixtimaalka
lagu soo saaraya kaar ayku qoran tahay shaqal waa $\frac{4}{11}$.
- t. Waxaa ku jira 7 shiibane erayga MATHEMATICS. Sidaas dareedeed
ixtimaalka soo saarida shiibane yaashu waa $\frac{7}{11}$.
- j. Maadaama oo ay kujiraa laba "M" erayga MATHEMATICS ixtimaalka
soo saarid xarafka M waa $\frac{2}{11}$.
7. Urur wuxuu leeyahay 52 ku tirsane
- b. maadaama oo ay ku jiraan 26 oo madawah ixtimaraal helida kaarar ka
madaw waa $\frac{26}{52} = \frac{1}{2}$.
- t. 52 kaar, 13 waa dheeman, 4, waa baasheyaal 13 ka dheemanta, ah
midkamida waa baashe sidaas darted 16 kaar ayaa ah dheeman ama
baasheyaal.

Markaa ixtimaalka helida baasheyaasha ama dheemantu waa $\frac{16}{52} = \frac{4}{13}$.

- j. Waxaa ku jira 4 kaar oo qulaan, ah sidaas darted ixtimaalka soosaarida qulaanku waa $\frac{4}{52} = \frac{1}{13}$.
8. Ixtimaalka dhacda' du badanaa wuxuu udhexeeyaa "0" iyo "1" ama wuxuu u dhexeeyaa 0% iyo 100%.
- b. -0.01 manoqon karo ixtimaal. t. 0.5 wuu noqon karaa ixtimaal.
- j. 1.01 manoqon karo ixtimaal. x. 0 wuu noqon karaa ixtimaal
- kh. 1 wuu noqon karaa ixtimaal. d. 20% wuu noqon karaa ixtimaal
9. Haddii laadhu la dilaan diliyo caanteyna latuuro, markaa ururka ixtimaalka tijaabooyinku waa:-
 {1 Da, 2 Da, 3 Da, 4 Da, 5 Da, 6 Da, 1 Du, 2 Du, 3 Du, 4 Du, 5 Du, 6 Du}.
- Dhecda'da tiro kisi ah iyo Daabac, waa {1 Da, 3 Da, 5 Da} sidaas darteed ixtimaalka-koodu waa $\frac{3}{12} = \frac{1}{4}$.
10. Haddii aad laba laadhu tuurtid hal mar, markaa wadarta labada tiro ee u dhexeeya 2 iyo 12. Waa:-
- b. 0 t. $\frac{1}{2}$ j. 1
11. Ururka ixtimaalka dad ah ayaa kakooban 200, qof, 70 kamid ah dhiigood waa nooca "0" sidaas darted ixtimaalka uu qof dhiigiisu kunoqonayo "0" waa $\frac{7}{20} = \frac{7}{20}$.
12. Uqaado r iney tahay tirada kubadaha cas markaa tirada kubadaha cagaarka ahi waa $\frac{1}{3}r$. Sidaas darted wadarta tirada kubaduhu waa $r + \frac{1}{3}r = \frac{4r}{3}$.
- Itmaalkooduna waa $\frac{\frac{r}{4}}{\frac{4}{3}r} = \frac{3}{4}$.

CUTUBKA JOOMATERIGA IYO CABBIRAADDA

HORDHAC

Ardaydu waxay yaqaanaan nuxurada joomateriga looga baahan yahay qaybta xisaabtaku lug leh muuqalada iyo baaxadaha (cabbirada). Waxa kaloo ay wax ka barten uisticmaalka joomateriga adduunyada xaqiiqada ah ooqaarkood. Cutubkani waxay ku baran doonaan joomateriga iyo cabbiraadda lagu bandhigay saddexda cutub-hoosaad.

Labada cutub-hoosaad ee hore waxay la xidhiidhsan yihiin dhinacyada iyo xaglaha saddexagal quman (saddexagal xagal quman leh). Cutub-hoosaadka u horeeya waxa lagu faahfaahiyey laba aragtiin ee sida wayn loo wada yaqaano. Argatiinka yukliidh iyo Aragtiinka Baytogras.

Cutub-hoosaadka labaad waxa lagu dhex falanqeyey saddexda saamiyada tirignoomateriga ee saddexda ah, saynka, kosaynka iyo taanjantiga xagasha fiiqan ee saddexagalka quman.

Qaybta saddexaad, waxa lagu dhex bayaamiyey laba shaxanno adke ah, oo kala ah; bayraamidh iyo toobinno iyo sidoo kale qaybahooda.

Cutub-hoosaad kasta waxaa ka hormarsan warbixinta (qoraalka) fekradaha taariikheed ee ay leeyihiin.

Ujeeddooyinka cutubka

Dhamaadka cutubkan ka dib, ardaydu waxay awood u yeelan doontaa in ay:

- *Fahmaan nuxurada aasaaska u ah saddexagalada xagal quman*
- *Uadeegsadaan aragtiinada muhiimka ku ah saddexagalada xagasha quman*
- *Garawsadaan xeerarka salka u ah saamiyada tirignoomateri.*
- *Gartaan noocyada kala duwan ee bayraamidhyada iyo qaybaha ay wadaagaan.*
- *Aqoonsadaan toobinada iyo qaybaha ay wadaagaan*

Kaabayasha loo Doorbiday

- Jaartiyo tusaya saddexagolo xagal qumman. Aragtiinada Yukliidh iyo Baytogras, saamiyo tirignoomateri iyo, saamiyatrignomateri ee xaglaha 45^0 , 30^0 iyo 60^0
- Qalab xisaabeedyada jibbaarma (set squares).
- Sawirada dhismo, geedo, taagyo ama tuuro tusaya, joogaggooda iyo fogaanta bar maguuraan ah ay u jiraan la soo saarayo
- Sawirada wabiyo, harooyin la raadinayo baladhkooda
- Moodeelada bayraamidhyo iyo toobino diyaarsan

7.1 ARAGTIINADA SADDEXAGALADDA XAGAL QUMAN

Xisadaha: 12xiso

Waxa ardayda laga rabo:

Dhamaadkacutub-hoosaadkan, ardaydu waxay awood u yeelan doonaan in ay:

- *U adeegsadaan aragtiinka Yukliidh iyo rogaalkiisa ku furfurashada su'aalaha ka hadlaya*
- *U adeegsadaan aragtiinka baytogras iyo rogaalka aragtiinkaas weedh-xisaabeedyada ku sal leh*

Erayada

- Aragtiinka yukliidh, rogaal, aragtiinka Baytogras, xagal quman, Addin, shakaal, sal.

Hordhac

Waxa laga soodiiray saddexagalada isu'eg ee u sameeyey joogga lagaga soo qotomiyey shakaalka xagasha quman ee saddexagal xagal quman.

Qaybta hore ee cutub-hoosaadkani waa soodiiridda iyo ku dabiqidida aragtiinka yukliidh gaar ahaan ku soo saaridda dhinacyada aan la ogayn.

Qaybta labaadna waxa lagu bandhigay xigista iyo u adeegsashada aragtiinka Baytogras, oo si dheeri ah loogu yeelay tusaalooyin ku habboon islamarkaa ku filan.

7.1.1 Aragtiinka Yukhidh iyo Rogaalkiisa

Fekradaha Barista

Hawlgal 7.1 ayaa looqorsheysay si aad ugubandhigto aragtiinka Yukliidh ka dibna aragtiinka Baytogras.

Si aad u bilawdo casharka, waxaa kuu suuragal ah inaad weydiiso weedho furan.

Waydii ardayda inay soo saaraan bedadka laydiyo aad ku kala magacowdo A, B, C iyo D. Arday kasta waxa laga rabaa inuu soo saaro bedka laydi walba.

Ku dhiirigeli ardayda siday si nadaamah ugu soo hagmi lahaayeen aragtiinka Yukliid. Tusaale ahaan, bedka dhulka u leeyahay A waa $(30m)^2=900m^2$ Taasi waxay tusaysaa in $RQ^2=RS \times PR$ waxa sidoo kale, bedka B waa $(40m)^2=1600m^2$ iyo bedka

$$C \text{ waa } 32m \times 50m = 1600m^2$$

$$\text{t.a } (40m)^2 = 32m \times 50m$$

Mar kale, tani waxay muujisaa in $PQ^2=PS \times PR$ weedha furan loo isticmaali karo oo lagu bandhigkaro aragtiinka Baytogras kolka la barayo cutub- hoosaad 7.1.2

Si falanqaynta loo gunaanado ayaa halkan waxaad ku siin kartaa furfurista weedha.

Jawaabta weedha furan

1. Badka dhul beereedyada ay kala leeyihiin A waa $900m^2$; B waa $1600m^2$, C waa $1600m^2$ iyo D waa $900m^2$.
2. Beeroleyada waxay leeyihiin dhul beereedyo bedad kala duwan.
3. A iyo B waa $900m^2 + 1600m^2 = 2500m^2$ dhul ah, C iyo D waa $900m^2 + 1600m^2 = 2500m^2$ dhul ah.

Bedadka dhulka ay laba kasta ay leeyihiin waa isku mid ka hor intaan la gudagalin shaqada hawlgal 7.1. Hubi inuu arday walba sawiri karo saddexagal xagal quman una ku qori karo addimada iyo shakaalka. Tan waxay u qabsoomi kartaa tii oo afka laga waydiinayo ardayda sida jaantus 7.2, waa kee xagasha qumani? kee ayaa ah addin: shakaal: iwm

Haddaba, su'aalaha 1, 2 iyo 3 waxaa lagu falanqayn karaa af ahaan. Gudagalka su'aasha 4, ardaydu waa in ay garowsan yihiin saddexagalada isu'eg iyadoo lagu dhiirigalinayo si ay u sheegaan hawraaraha kuwa ka dhigaya saddexagalo isu'eg. Su'aasha 5 dhexdeeda, ardayda ku hag u isticmaalida saamiyada dhinacyada gudboon si ay u sahamiyaan aragtiinka yukliidh.

Halkan, shaqada waxa loo fidin in ardayda lagu hoggaamiyo sidii loo soo gunaanadi lahaa in xeerku ku run yahay saddexagal xagal quman kasta

Jawaabaha hawlgal 7.1

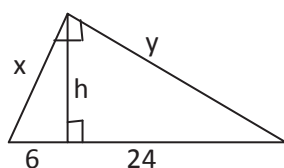
1. Laba saddexagal quman cusub ayaa sameysmey.
2. $\triangle ADC$ iyo $\triangle BDC$
3. b. $\angle A \cong \angle BCD$ t. $\angle B \cong \angle ACD$
4. b. $\triangle CBD \sim \triangle ABC$ isu e'kaansho AA
t. $\triangle CBD \sim \triangle ABC$ isu e'kaansho AA
5. b. $a^2 = cb_2$, maadaama dhinacyadu ay isku saamigalsanyihiin
t. $b^2 = cb_1$

Siinta furfurista hawlgal 7.1 ka dib u sheeg aragtiinka yukhiidh oo kala xaajoo tusaalooyinka ayka shaqeyaan fasalku. Ama kooxo. Ku shaqaynta tusaalooyinku waxay ardaydu ka helayaan awoodo kolkey baranayaan ku salaysan jawaab celin u sii masalooyin laylis ahaan ardayda liidata iyo kuwa kaleba.

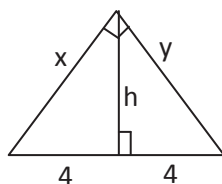
Masalooyin laylis dheeri u ah ardayda liidata

Raadi qiimayaasha x , y iyo h mid kastoo saddexagallada xagasha quman ee soo socda

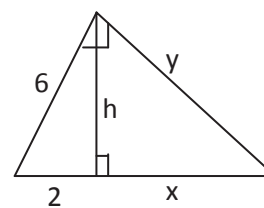
1.



2.



3.



Furfuris:

$$1 \quad x^2 = 6(6 + 24) = 180;$$

$$x = 3\sqrt{20}$$

$$h^2 = 6 \times 24$$

$$h = 12$$

$$y^2 = 24 \times 30$$

$$y = 12\sqrt{5}$$

$$2. \quad x^2 = 4(4 + 4);$$

$$h = 4$$

$$h^2 = 4 \times 4;$$

$$x = 4\sqrt{2}$$

$$y^2 = 4 \times 4$$

$$y = 4$$

$$3. \quad 6^2 = 2(2 + x);$$

$$18 = 2 + x$$

$$x = 16$$

$$= 16 \times 18$$

$$h^2 = 2 \times 16;$$

$$h = 4\sqrt{2}$$

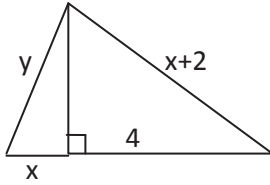
$$y^2 = x(x + 2)$$

$$y = 12\sqrt{12}$$

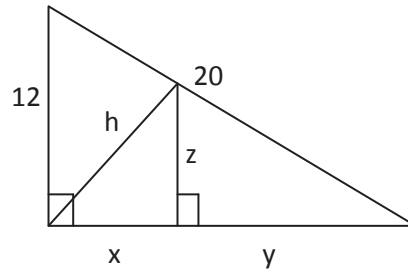
Masalooyinka layliska dheeriga u ah ardayda fahamka sare leh.

Raadi dhererada maqan ee dhinacyada saddexagalka xagal quman ee soo socda.

1.



2.



Furfuris:

$$1. \quad y^2 = x(x+4)$$

$$x^2 + 4x + 4 = 16 + 4x$$

$$x^2 = 12$$

$$x = 2\sqrt{3}$$

$$2. \quad 12^2 = mx \cdot 20$$

$$m = \frac{144}{20}$$

$$= \frac{36}{5}$$

$$(x+y)^2 = 20(20-m);$$

$$(x+y)^2 = 20\left(20 - \frac{36}{5}\right)$$

$$= 4 \times 64$$

$$x+y = 16$$

$$y^2 = 2\sqrt{3}(2\sqrt{3}+4)$$

$$= 12 + 8\sqrt{3}$$

$$= 4(3 + 2\sqrt{3})$$

$$y = \sqrt{4(3 + 2\sqrt{3})} = 2\sqrt{3 + 2\sqrt{3}}$$

$$h^2 = mx(20-m)$$

$$= \frac{36}{5} \times \left(20 - \frac{36}{5}\right)$$

$$= \frac{36 \times 64}{25}$$

$$h = \frac{6 \times 8}{5} = \frac{48}{5}$$

$$h^2 = x(x+y) \quad z^2 = x-y$$

$$\left(\frac{48}{5}\right)^2 = x(16) = \frac{144}{16} \times 7$$

$$x = \frac{48^2}{25} \times \frac{1}{16} = 63$$

$$= \frac{144}{25}$$

Ka dib kolkay yaraato aad u kala fogaanshaha fahamka ardaydu u gudub shaqo kooxeed 7.2. shaqo kooxeedkan wuxu u qorshaysan yahay si loo tuso adeegsasha aragtinka Yukhidh ku furfurista masalooyinka nolosha runta ah

Furfuridda masalada shaqo kooxeed 7.1. ka codso ardayda gaar ah kooxo kala duwan inay tusaan dhererada dhinacyada sida \overline{CD} , \overline{DB} , \overline{BC} iwm.

Ku dhiirgali ardaydu inay ka doodaan istaraatiijiyadda furfuriridda masalada.

Waa inay soo saaraan jawaabta masaladan. Hawshaadu waa inaad gargaarto kuwa kaaga baahan gacansiinta. Dhamaadka hubi jawaabtao ka codso ardayda qaarkood si ay ugu tusaan sabuuradda.

Jawaabta shaqo kooxeed 7.1

Kadib kolkaad siiso jawaabta shaqo kooxeed, kawada hadla tusaalooyinka ka shaqeysan islamarkaana u sii laylis 7.1 shaqo fasal ama shaqo guri.

Furturis: Wadarta fogaantu waxay le'eg tahay $CD+BD+BC+CE+ED+DA+AE$

Fiiri $\triangle ACD$, AC waa shakaalka, AD iyo DC waa addimo.

$$\begin{aligned} \text{Kolkaa } DC^2 &= CE \times CA \\ &= 3 \times (6 + 3) \text{ km}^2 \\ &= 3 \times 9 \text{ km}^2 \\ DC &= 3\sqrt{3} \text{ km} \end{aligned}$$

Fiiri $\triangle ABC$

$$\overline{AC}^2 = AD \times AB = (3\sqrt{6} \text{ km}) \times AB$$

$$81 \text{ km}^2 = (3\sqrt{6} \text{ km}) \times AB$$

$$AB = \frac{81}{3\sqrt{6}} \text{ km} = \frac{27}{\sqrt{6}} \text{ km} = \frac{27\sqrt{6}}{6} \text{ km} = 4.5\sqrt{6} \text{ km}$$

$$BD = AB - AD = (4.5\sqrt{6} - 3\sqrt{6}) \text{ km} = 1.5\sqrt{6} \text{ km}$$

$$\begin{aligned} (9 \text{ km})^2 &= BC^2 = BD \times AB = 1.5\sqrt{6} \times 4.5\sqrt{6} \text{ km}^2 \\ &= 1.5 \times 1.5 \times 3 \times \sqrt{6} \text{ km}^2 \\ &= 1.5^2 \times \sqrt{6}^2 \times 3 \text{ km} \\ &= 1.5 \times 6 \sqrt{3} \text{ km} \\ BC &= 9\sqrt{3} \text{ km} \end{aligned}$$

Wadarta fogaanta u basku gaadhay waa $CD+BD+BC+CE+ED+DA+QE$

$$\begin{aligned} &CD + DB + BC + CE + ED + DA + AE \\ &= (3\sqrt{3} + 1.5\sqrt{6} + 9\sqrt{3} + 3 + 3\sqrt{2} + 3\sqrt{6} + 6) \text{ km} \approx 42.05 \text{ km} \end{aligned}$$

Jawaabta Layliska 7.1

Layliska waxa loogu qorsheeyey ardaydaasi loogu qiimeeyo sifaha fahamka waxbarasho iyo adeegsashada aragtiinka yukliidh inay ardaydu si fiican u fahmeen cinwaan hoosaadka iyo inkale.

1. Layliskan dhexdiisa, $a^2 = b_1 (b_1 + b_2)$ islamarkaa $b^2 = b_2 (b_1 + b_2)$

b.	$a^2 = b_1 (b_1 + b_2)$ $= 2(2 + 6)$ $= 16$ $a = 4$	$b^2 = b_2 (b_1 + b_2)$ $= 6 (2 + 6)$ $= 48$ $b = 4\sqrt{3}$
t.	$a^2 = 3(3 + 6)$ $= 27$ $a = 3\sqrt{3}$	$b^2 = 6 (3 + 6)$ $= 54$ $b = 3\sqrt{6}$
J.	$a^2 = 1.5 (1.5 + 2.5)$ $= 6$ $a = \sqrt{6}$	$b^2 = 2.5 (1.5 + 2.5)$ $= 10$ $b = \sqrt{10}$
x.	$a^2 = (\sqrt{2} + 2\sqrt{2})$ $= \sqrt{2} (3\sqrt{2})$ $= 6$ $a = \sqrt{6}$	$b^2 = 2\sqrt{2} (\sqrt{2} + 2\sqrt{2})$ $= 2\sqrt{2} (3\sqrt{2})$ $= 12$ $b = 2\sqrt{3}$
b.	$a^2 = 3 (3 + 9)$ $= 36 = a = 6$	$b^2 = 9 (3 + 9)$ $= 108 = b = 6\sqrt{3}$
j.	$6^2 = 4 (4 + y)$ $36 = 16 + 4y$ $4y = 20$ $y = 5$	$x^2 = y (y + 9)$ $= 5(5 + 9)$ $= 70$ $x = \sqrt{70}$

t. i. $9^2 = 41n$

$$n = \frac{81}{41}$$

Laakiin $m + n = 41$. Kolkaa, $m = 41 - \frac{81}{41} = \frac{1600}{41}$

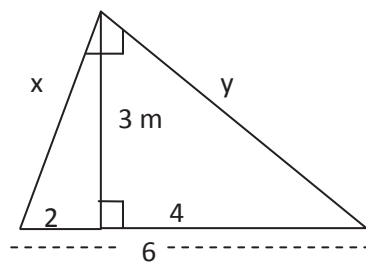
$$\text{ii. } h^2 = mn = \frac{81}{41} \times \frac{1600}{41}$$

$$h = \frac{9 \times 40}{41} = \frac{360}{41}$$

$$\text{iii. } p^2 = 41m$$

$$= 41 \left(\frac{1600}{41} \right) = 1600 \Rightarrow P = 40$$

2. Sawirka ijaarka kolka la eego, wuxuu Leeyahay 5 walax dhidban oo midkasta dherer kiisu yahay 3m. Wadartadhererkoodu waa 15m. Wuxuu leeyahay laba walxood oo jiifa oo mid kastaa yahay 6m. Wadarta dhererkoodu waa 12m. Qalabyada kalewaa sida saansaanta adimada saddexxaggal xagal quman oo adinka loo soo saaro sidan soo socata.



$$x^2 = 2 \times 6m^2$$

$$= 12m^2$$

$$x = \sqrt{12m^2}$$

$$x = 2\sqrt{3}m^2$$

$$y^2 = 4 \times 6m^2$$

$$= 24m^2$$

$$y = \sqrt{4 \times 6m^2}$$

$$y = 2\sqrt{6}m$$

Wadarta Dhererka qalabku waa $(15 + 12 + 2\sqrt{3} + 2\sqrt{6})m = (27 + 2\sqrt{3} + 4\sqrt{6})m$

Rogaalka aragtiinka Yukliidh

Cinwaankan waxa lagu bilaabi karaa macnaha eray xisaabeedka “rogaal” tii oo la adeegsanayo noocyada tusaalooyinka soo socda oo kale

Tusaale – 1: Haddii x iyo y ay yihiin tirooyin idil kisi ahkolkaa taranta xy waa tiro idil kisi ah.

Rogaal: Haddii laba tiro idil taranta xy kisi tahay, kolkaa x iyo y waa tirooyin kisi ah. Halkan hawraarta iyo rogaalkeedu waa run.

Tusaale – 2: Haddii x iyo y ay yihiin tirooyin idil kisi ah kolkaa wadarta $x+y$ waa tiro idil oo dhaban ah.

Rogaal: Haddii wadarta $x + y$ ay laba tirooyin idil x iyo y ay yihiin dhaban, kolkaa x iyo y waa troyin idil kisiah. Halkan hawraartu waa run laakin rogaalku waa been

Ka dib waxaad casharka u bilaabi kartaa si toosa adoosiinaya hawlgal 7.2 fasalka ama koox koox ardayda.

Ardayda waa inaad ku dhiirgalisaa si ay u muujiyaanisle'ekaanshaha.

$$AC^2=AD \times AB$$

$$BC^2=BD \times AB$$

Go'aami in ΔABC u yahay saddexagal qumanooxagashiisa quman tahay C.

Doodu waa inay ku wajahanaataa rogaal aragtiinka yukliidh.

Waa inaanay u malayn kaliya in la fiirinayo shaxanka.

Dhamaadka ardayda waxa laga filayaa inay iskood u qoraan. Aragtiinka rogaalka yukliidh.

Dhamaadka sii jawaabta hawlgal 7.2 oo sheeg aragtiinka yukliidh. La falanqee tusaalooyin haka shaqeyaan fasalka ama kooxo.

Jawaabta hawlgal 7.2

1. Waxa cad in $2^2=1(1+3)$ islamarkaa $(2\sqrt{3})^3 = 3(1+3)$. Kolkaa, ΔABC waa saddexagal xagal quman.
2. $6^2=36$ islamarkaa $3.6(3.6+6.4)=36$
 $8^2=64$ islamarkaa $6.4(3.6+6.4) = 64$
 Haddaba, ΔABC waa saddexagal quman
3. $8^2=64$ islamarkaa $4(4+12)=64$

$$(16\sqrt{3})^2 = 768 \text{ laakiin } 12(4+12)=196$$

Tani waxay ku tusaysaa in ΔABC aanu ahayn saddexagal quman.

7.1.2 Aragtiinka Baytogras iyo rogaalkiisa

Fekradaha Barista

Waa wax adiga iyo ardayduba aad u baahantihin inaad wadatiin qalabada looga baahan yahay shaqada hawlgal 7.3

Waxa taa garab socda dabaashiir midabo leh ama (qalin qori) iyo jaartiyo darbiga la sudho ayaa muhiim u ah ka shaqeynta hawlga 7.3, ardaydu waxay u baahan yihiin in lagu xiiso geliyo inay cabbiraan dhererada dhinacyada walxaha tilmaaman oo ay buuxiyaan tusaha.

Su'aasha 1, waxa lagu siiyey ardayda dherero qiyaasan waxayna isbarbardhigi labajibaarada dhererada ugu dhawaan ugu dhawaanta xisaabintu waxay ku fiican tahay inay isticmaalan kalkulator. Ardaydu waa inay aqoonsanaadaan inuu jiri doono ugu dhawaansho kolka ay furfurayaan masalooyinka nolosha dhabta ah. Tasaale ahaan. Waxay heli karaan in dhererka sallaan ku tiirsan joogga darbiyahay $\sqrt{99}$ m; xaaladani waxa lagu soo dhaweyn 10m.

Su'aasha 2, Dhererada runta ahee addimada ayaa la siiyey, laakin kolka ay cabbirayaan shakaalka ayaa waxaa suuragal ah inaanay helin cabbirka runta ah.

La falanqeynta tusaalooyinka laga shaqeeyey fasalka kooxaha ka dib tus adeegsiyada adoo isticmaalaya tusaalooyin kala gedgedisan kuwa la xidhiidha dhererada dhinacyada saddexagal quman.

Tus jaarti darbiga ku diyaarsan si ardaydu u xiiseeyaan furfuridda masalooyinka loo adeegsado oo ku wajahan falanqeynta fasal

Ka codso ardayda fahamka dheer inay ku tusaan ku dabaqidda dhibaatooyinka dhabta ah ee dunida.

Jawaabta hawlga 7.3

Hawlga 7.3 waxa loo qorsheeyey si loogu sahmiyo Aragtiinka Baytgoras.

2	a	b	c	$a^2 + b^2$	c^2
i	3	4	5	25	25
ii	5	12	13	169	169
iii	2	3	3.60	13	12.69
	1.5	14.75	14.83	219.83	219.83

d. $a^2 + b^2 + c^2$

e. saddexagal xagal quman wadarta labajibbaarada dhererada addimadu wuxu le'eg yahay labajibbaarka shakaalka.

Jawaabaha layliska 7.2

1 b. $c^2 = 9^2 + 12^2$

$$= 225$$

$$c = 15$$

j. $a^2 + a^2 = 30^2$

$$2a^2 = 900$$

$$a^2 = 450$$

$$a = 15\sqrt{2} \quad b = \sqrt{3}$$

t. $a^2 + 4^2 = 12^2$

$$a^2 = 128$$

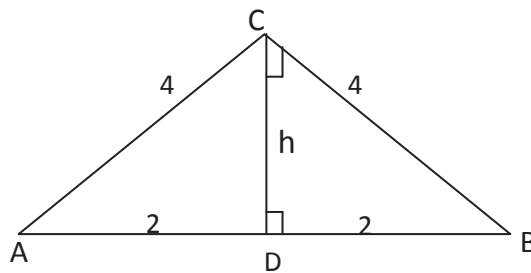
$$a = 8\sqrt{2}$$

x. $3^2 + b^2 = 4b^2$

$$3^2 = 3b^2$$

$$b^2 = 3$$

kh.



Aragtiinka saddexagal labaaale kolka loo eego DC waa

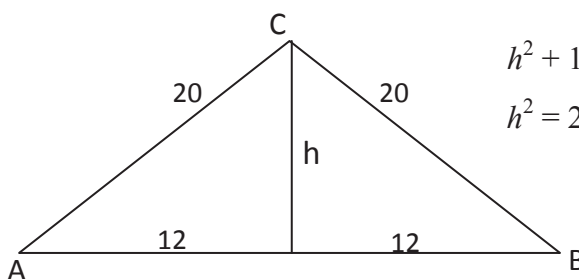
Qotome badhaha AB

Haddaba, $h^2 + 2^2 = 4^2$

$$h^2 = 12$$

$$h = 2\sqrt{3}$$

d.



$$h^2 + 12^2 = 20^2$$

$$h^2 = 256$$

$$h = 16$$

$$\begin{array}{lll}
 \text{r.} & x^2 = 5^2 + 5^2 \text{ s.} & c^2 = 6^2 + 8^2 & \text{sh.} & x^2 = 1^2 + 1 \\
 & x^2 = 2 \times 5^2 & c^2 = 100 & & x^2 = 2 \\
 & x = 5\sqrt{2} & c = 10 & & x = \sqrt{2} \\
 & & & & y^2 = 1^2 + x^2 = 1 + 2 = 3 \\
 & & & & y = \sqrt{3} \\
 & & & & z^2 = 1^2 + y^2 = 1 + 3 = 4 \\
 & & & & x = 2
 \end{array}$$

2. Haddii ay wadarta labajibbaarada laba dherer le'eg tahay labajibbaarka dhererka ugu dheer, kolkaa saddexagalka dhinacyadiisa lagu siiyey waa saddexagal quman.

b. $8^2 + 15^2 = 289$ iyana $17^2 = 289$
saddexagalku waa saddexagalka quman ee dhererada dhinacyadu kala yihiin 8cm, 15cm iyo 17cm

t. $6^2 + 9^2 = 117 \neq 12^2$
dhererada dhinacyada lagu siiyey ma'noqon karaan dhererada dhinacyada saddexagal quman.

j. $14^2 + 16^2 = 452 \neq 18^2$ ma'aha saddexagal quman

x. $3^2 + (2\sqrt{10})^2 = 49 = 7^2$ waa saddexagal quman

kh. $4^2 + 4^2 = 32 \neq 25$, ma'aha suddexagal quman

d. $2^2 + (3.75)^2 = 4.25^2$

3. b. ka soo qaad dhererka joogga saddexagalku inuu yahay h, kolkaa
 $5^2 + h^2 = 13^2$

$$h^2 = 144$$

$$h = 12$$

t. ka dhig in gurigu u jiro lm

$$\text{Haddaba, } l^2 = 40^2 + 41^2$$

$$= 1600 + 1681$$

$$= 3281$$

$$l = 56.4\text{m}$$

Gurigu wuxuu u jiraa 56.4m.

j. meesha joogiisu waa shan dhinacle dhinac yahay x

$$\text{Haddaba, } x^2 = 3^2 + 4^2 = 25 = 5 \Rightarrow x = 5$$

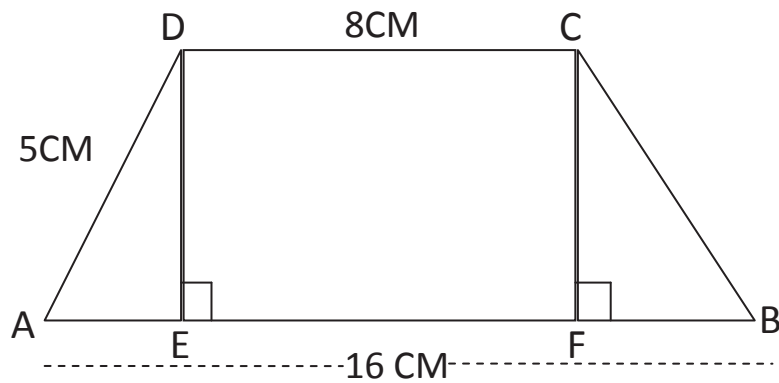
Dhinac kastaa waa 5cm.

4. Ka dhig in u dhererka xaglagooyuhu yahay d , haddaba

$$\begin{aligned} d^2 &= (\sqrt{7})^2 + 3^2 \\ &= 7 + 9 \\ &= 16 \end{aligned}$$

$$d = 4$$

5. Ka dhig ABCD koor labaale ah oo $\overline{AB} \parallel \overline{CD}$ tahay. Fiiri jaantuska



$AE = FB$ maadaama ABCD u yahay labaale, $AE + EF + FB = AB$

$$2AE + 8 = 16 \quad \text{woayo } \overline{EF} = \overline{DC}$$

$$AE = 4$$

$$AE^2 + h^2 = 5^2$$

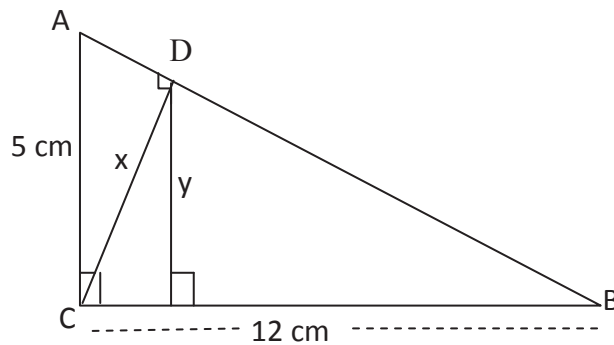
$$h^2 = 9$$

$$h = 3$$

6. $(3k)^2 + (4k)^2 = (5k)^2$

$$9k^2 + 16k^2 = 25k^2$$

Isle'ekaanshahani waa run sidaadarteed $3k$, $4k$, iyo $5k$, waa saddexanka Baytograas. Hawraartu waa ku run tiro maangal kastoo k ah



7. Fiiri shaxanka 7

$$AB^2 = AC^2 + BC^2$$

$$= 5^2 + 12^2$$

$$= 169$$

$$AB = 13$$

Isticmaalka aragtiinka Yukliidh

$$AC^2 = AD + AB$$

$$25^2 = AD + 13 \text{ cm}$$

$$AD = \frac{25^2}{13} \text{ cm}$$

$$x^2 + AD^2 = AC^2$$

$$x^2 + \left(\frac{25}{13}\right)^2 = 15^2$$

Iyana, $x^2 = CE \times CB$ waayo $\triangle BCD$ waa saddexagalka quman oo ka quman $\angle D$

$$\frac{4200}{169} = 12 \text{ CE}$$

$$CE = \frac{4200}{169} \times \frac{1}{2} = \frac{350}{169}$$

$$y^2 = CE \times EB$$

Lakiin $EB = CB - CE$

$$= 12 - \frac{350}{169} = \frac{2018}{169}$$

$$y^2 = CE \times EB$$

Lakiin $EB = CB - CE = 12 - \frac{350}{169}$

$$\text{Kolkaa, } y^2 = \frac{350}{169} \times \frac{2018}{169}$$

$$y = \sqrt{\frac{350}{169} \times \frac{2018}{169}} = \frac{10\sqrt{42}}{13}$$

7.2 HORDHACA TRIGONOMATERI

Xiso lasiiyey: Xiso

Ujeeddooyinka Qaybta

Dhamaadka cutub-hoosaadkan ardaydu waxay awood u yeelan doonaan in ay:

- *Sharaxaan saamiyada trigonoomateri, saynka, kosaynka iyo taanjantka tii oo ay adeegsanayaan saddexagal quman*
- *Soo saaraan giimaha xaglaha saamiyada tirignomateriga ee 30^0 , 45^0 iyo 60^0 .*
- *U adeegsan saamiyada trigonoomateriga xaglaha 30^0 iyo 60^0 ku furfurashada weedh xisaabeedyoda ku lug leh.*

Erayo

- Saami tirignomateri, sayn, koosayn, taanjant

Hordhac

Cutub-hoosaadkan, ardaydu waxay u isticmaali xaglaha saddexagal quman si ay u soo saaraan dhinacyada maqan in kastoo ay dhamaan xagluhu leeyihiin saamiyo trigonometri kaliya cutub-hoosaadkan waxa lagu bandhigay 30^0 , 45^0 iyo 60^0 . Saynka, kosaynka iyo taanjantka xagalaha fiiqan ee saddexagal quman.

Fekradda barista

Waxaad ku bilaabi kartaa casharka weydiimo afka ah, sida: sheeg addimada iyo shakaalka saddex-xagalka quman. Tani ayaana u ah qiimeyn intaan casharka la gudagalin.

U Adeegso hawlgal 7.4 ujeedadan

Jawaabaha hawlgal 7.4

1. \overline{AB} waa shakaalka
2. \overline{AC} waxay ka soo horjeedaa $\angle B$
3. \overline{BC} waxay ka soo horjeedaa $\angle A$
4. \overline{BC} waa la deris $\angle B$
5. \overline{AC} waa la deris $\angle A$

Ka shaqaynta shaqo-kooxeed 7.4, ardaydu waa inay la yimaadaan qalabyada ku qoran buugga ardayga. Waa in loo sheegaa in ay si deggen u aqriyaan shuruuda (qodobada) ayna raacaan tallaabooyinka.

Saamiyo kala duwan ayaa ka gargaaraya inay xaqiijiyaan saamiyada trigonometri.

Waxa muhiim ah in ardayda lagu dhiirigaliyo si ay u cabbiraan si dhererada dhinacyada si taxadir leh islamarkaana intii suuragal ah oo hufan ay natiijooyinka ugaliyaan tusaha.

Ka dib ardayda kolka ay shaxda buuxiyaan, waa inaad hubisaa jawaabuhu inay yihiin kuwa u dhow saamiyada la midka ah iyo in kale.

U dooro arday gaar ah si ay ugu buuxiyaan jawaabaha jaartiga diyaarsan ama sabuuradda korkeeda si ay dhamaan ardaydu u hubiso shaqadoodii.

Waxa xiga soo koobidda xogaha baadhista ardayda iney heleen islamarkaana sharax saamiyada trignoomateri.

La falanqee fasalka ama kooxo tusaalooyin laga shaqeeyo oo ugu qiimee kartida ay u yeeshaan xiliga waxbarashadu socoto islamarkaa aqoonsa ardayda kuwa uga baahan gacansiin iyo kuwa kalidood lagaga tagi karo.

Ugu dambeyn shaqo fasal ama shaqo guri u sii laylis 7.3 si loogu qiimeeyo fahamka guud ahaan casharka.

Adoo u eegaya jawaabcelinta, u isticmaal hawlgalo dheeri ah kolka loo eego awooddaay u yeesheen

Jawaabaha shaqo-kooxeed 7.4

1. Ku dhex wareegardayda oohubiinay cabbirayaanama ayguurinayaan shaxanka iyo kale. Siigargaar kuwa kaaga baahan.
2. Hubi in ardayda intooda badani ku buuxiyeen tusaha qiimaha ugu dhaw oo isku mid ah
Ka codsi xubno kooxaha ka mid ahi ay fasalka u sheegaan. Tani ayaa kaa caawin doonta inaad yareyso kala duwanaanshaha cabbiridda dhinacyada.
3. Maadaama dhereradu ay isle'e kaansho isu dhaw yihiin ma yeelanayaan faraq weyn saamiyada kooxaho kala duwan.
4. Ugu hogaami ardayda si nidaamsan inaad ugu gunaanaddo in saamiyadu aan ay ku tiirsanayn baaxadda saddexagalada.
5. Xusuusi ardayda in maadaama saddexagaladu isue'g yihiin ay dhinacyada isu saamigal yihiin.
6. Tani waa qayb muhiim u ah shaqo-kooxeedka. Waayo cabbiridda dhererada dhinacyada ma khuseyso.

Jawaabaha Laylis 7.3

$$1. \quad b. \quad \sin x^0 = \frac{12}{15} = \frac{4}{5} = 0.8 = \frac{12}{15} = \frac{4}{5} = 0.8$$

$$\cos x = \frac{9}{15} = \frac{3}{5} = 0.6$$

$$\tan x^0 = \frac{12}{9} = \frac{4}{3}$$

- t. Shaqada ugu horeysa waa helidda dherer ka \overline{DE}
Haddaba, $DE^2 = 2^2 + 10^2$

$$= 104$$

$$DE = 2\sqrt{26}$$

Kolkaa,

$$\text{sayn } y^0 = \frac{2}{2\sqrt{26}} = \frac{1}{\sqrt{26}} = \frac{\sqrt{26}}{26}$$

$$\text{kosayn } y^0 = \frac{10}{2\sqrt{26}} = \frac{5}{\sqrt{26}} = \frac{5\sqrt{26}}{26}$$

$$\text{taan } y^0 = \frac{2}{10} = 0.2$$

- j. $RQ^2 + 4^2 = 8^2$ $\text{sayn } p = \frac{4\sqrt{3}}{8} = \frac{\sqrt{3}}{2}$

$$RQ^2 = 48^2$$

$$\text{kosayn } p = \frac{4}{8} = \frac{1}{2}$$

$$RQ = 4\sqrt{3}$$

$$\text{taan } p = \frac{4\sqrt{3}}{4} = \sqrt{3}$$

- x. $AB^2 = 8^2 + 15^2$
 $= 289$

$$AB = 17$$

Aragtiinka yukliidh kolka loo eego

$$8^2 = AD \times AB$$

$$= AD \times 17$$

$$AD = \frac{64}{17}$$

$$\text{Kolkaa, } BD = 17 - \frac{64}{17}$$

$$= \frac{225}{17}$$

$$DC^2 = AD \times BD = \frac{64}{17} \times \frac{225}{17}, \text{ sidoo kale } DC = \frac{8 \times 15}{17} = \frac{120}{17}$$

$$\tan x^0 = \frac{AD}{DC} = \frac{\left(\frac{64}{17}\right)}{\left(\frac{120}{17}\right)} = \frac{64}{120} = \frac{8}{15}$$

$$\sin y^0 = \frac{BD}{BC} = \frac{\left(\frac{225}{17}\right)}{15} = \frac{15}{17}$$

$$\cos y^0 = \frac{CD}{BC} = \frac{\left(\frac{120}{17}\right)}{15} = \frac{8}{17}$$

$$\tan y^0 = \frac{BD}{DC} = \frac{\left(\frac{225}{17}\right)}{\left(\frac{120}{17}\right)} = \frac{15}{8}$$

kh. $\triangle DEF$ waa saddexagal siman, kolkaa, FG waa qotome qaybshaha DE .

$$\text{Sida, } DG = GE = 2$$

$$\text{Iyana, } GF^2 + 2^2 = 4^2$$

$$GF^2 = 12$$

$$GF = 2\sqrt{3}$$

$$\text{Haddaba, } \sin(m(\angle EFG)) = \frac{2}{4} = \frac{1}{2}$$

$$\cos(m(\angle EFG)) = \frac{GF}{4} = \frac{2\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$$

$$\tan(m(\angle EFG)) = \frac{2}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{2}$$

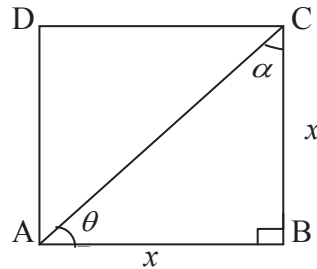
$$\sin D = \frac{GF}{4} = \frac{2\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$$

$$\cos D = \frac{DG}{4} = \frac{2}{4} = \frac{1}{2}$$

$$\tan D = \frac{GF}{DG} = \frac{2\sqrt{3}}{2} = \sqrt{3}$$

$$\tan D = \frac{15}{10} = 1.5$$

2. Waxa run ah in xagasha ay sameeyaan xaglagooyeyiyo dhinaca labajibbaarane tahay 45° . Si dheeri ah ardaydu waxay u baahan yihiin inay tusaan saamiyada tirignoomateri iyagoo fiirinaya labajibbaarane.



ABCD waa labajibbaarane dhinac yahay x .

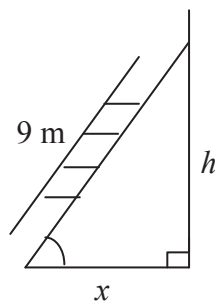
$$\text{Kolkoo, } AC^2 = x^2 + x^2 = 2x^2$$

$$AC = x\sqrt{2}$$

$$\sin \theta = \frac{BC}{AC} = \frac{x}{x\sqrt{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\text{Sidoo kale, } \cos \theta = \frac{\sqrt{2}}{2}$$

3. Sawir shaxan sharaxaya siaashan. Fiiri Jaantuska 7.



Jaan 7

Ka soo qaad in dhererka salaanku Joogga darbiga u ka gaadhay tahay h . Ka soo qaad in sallaanku ujiro darbiga x halbeeg. Ka dhig θ inay tahay xagasha sallaanka iyo dhulku sameeyaan.

Kolkaa, $x^2 + h^2 = 9^2$

$$4. \quad \tan \theta = \frac{h}{x}$$

$$0.35 = \frac{h}{x}$$

$$x = \frac{h}{0.35} = \frac{20h}{7}$$

Haddaba, $x^2 + h^2 = 81$

$$\left(\frac{20h}{7}\right)^2 + h^2 = 81$$

$$\frac{400h^2}{49} + h^2 = 81$$

$$400h^2 + 49h^2 = 49 \times 81$$

$$h^2 = \frac{49 \times 81}{449} \Rightarrow h = \frac{63}{\sqrt{449}}$$

7.2.2 Qiimeyaasha saynka, kosaynka iyo Taanjantka xaglaho 45° , 30° iyo 60°

Waxa ardayda laga filiyaa inay ku keenaanshaqada hawlgalka 7.4. qiimeyaasha. Tani waxaa lagu dhiirigalin karaa arday kastaa inuu baadhis kaga helo saamiyada tirignoomateriga hawlgalka inta lagu jiro. Waa inaad ku daysaa ardaydu inay gunaanadaan saynka, kosaynka iyo tanjantka $\angle A$ iyo $\angle B$.

Dhamaadka hawlgalka 7.4 ka dib, waydii ardayda qaarka midah inay sheegaan qiimayaasha saamiyada tirignoomateri ee ay soo saareen.

Waxa suuragal ah in ardayda qaarkood ay adeegsadeen aragtiinka Baytograf, qaar koodna ay shakaalka ku cabbireen mastarad.

Ardaydu waxay u baahan yihiin inay ka wada hadlaam faraqyadani islamarkaa ay ku gaadhaan ama go'aamiyaan saamiyad tirignoomateri hufan.

Falanqaynta fasal ama shaqo kooxeed waa in uu u dhacaa hubantida ah in badanka saamiyada lagu helay baadhista ay isku mid yihiin.

Hawlgal 7.5

Hawsha hore waa hubaasha in ardaydu ay sawireen saddexagal labaale ah oo addimadu ay yihiin 10cm iyo in kale.

1. Ardaydu waxay soo saari dhererka shakaalka iyagoo istic-maalaya aragtiinka Baytogoras. Waxaad tani u isticmaali kartaa mudnaan. Waa inay ugu horaanta cabbiraan oo ay helaan ugu dhawaanta saamiyada trignomateri ee.
2. $m(\angle A) = 45^\circ$ iyo $m(\angle B) = 45^\circ$
3. $\sin A = \cos A = 0.5$
 $\tan A = 1$
4. Waydii ardayda saamiyada trignoomatriga xaglaha 45° . Ugu dambeyn tus saamiyada trignomateriga xagasha 45° oo hubi. Haddana la falanqee tusaalooyin ka fasalku ama koox ay ka shaqeeyeen.

Jawaabta Hawlgalka 7.5

Saynka, koysaynka iyo taanjantka 30° iyo 60° xaglo ah. Ardayda waxa laga filayaa inay isticmaalaan habka lagu tusay Xagasha 45° Hawsha hore waa in la awoodsiyo ardayda si ay u sawiraan saddexagal leh 30° iyo 60° xaglo ah. Tani waxaynun siisaa fursadda inay sawiraan ama dhisaan saddexagalka qumanee leh xaglaha fiiqan ee 30° iyo 60° .

Jawaabta Hawlgalka 7.6

1. Waa inaad hubisaa in ardaydu ay haystaan qalabyada loo baahan yahay. Sida u tilmaamey buugga ardaygu ujeedada hawlgalku waa in lasoo saaro saamiyada trignomateriga xaglaha ah 30° iyo 60° .
Xaglaha 30° iyo 60° waxa sameeya saddexagal siman iyo joogga. Sababtani awgeed waa inay ardaydu awoodaan dhisitaanka saddexagal siman.
Cabbirka dhinac kasta waa 4cm maadaama dhinac kastaa yahay gacan. Haddaba nooca saddexagalku waa saddexagal siman. Kolkaa cabbirka xagal kastaa waa 60°
2. Dhererka joogga waxa lagu cabbiran karaa ugu dhawaanta dhowr god. Ardayda qaarkood waxay ku soo saari cabbiridda hufan tii oo la isticmaalayo aragtiin ka Baytogradas sida soo socota:
 - b. $CD^2 + BD^2 = AC^2$
 $CD^2 + 2^2 = 4^2$
 $CD^2 = 12$
 $CD = 2\sqrt{3}$
 - t. cabbirka xagasha $\angle ACD$ waa 30° .

$$\begin{aligned} \sin A &= \frac{CD}{AC} & \cos A &= \frac{AD}{AC} & \tan A &= \frac{CD}{AD} \\ &= \frac{2\sqrt{3}}{4} & &= \frac{2}{4} & &= \frac{2\sqrt{3}}{2} \\ &= \frac{\sqrt{2}}{3} & &= \frac{1}{2} & &= \sqrt{3} \end{aligned}$$

j. $\sin(m(\angle ACD)) = \frac{AD}{AC}$ $\cos(m(\angle ACD)) = \frac{CD}{AC}$, $\tan(m(\angle ACD)) = \frac{AD}{CD}$

$$\begin{aligned} &= \frac{2}{4} & &= \frac{2\sqrt{3}}{4} & &= \frac{2}{2\sqrt{3}} = \frac{1}{\sqrt{3}} \\ &= \frac{1}{2} & &= \frac{\sqrt{3}}{2} & &= \frac{\sqrt{3}}{3} \end{aligned}$$

3. Waxa cad in $\angle A \equiv \angle B$ islamarkaa $\angle BCD \equiv \angle ACD$, sida $\angle A$ iyo $\angle B$ ay ku yeesheen qiimo trignomateri isku mid ah. Iyana $\angle BCD$ iyo $\angle ACD$ waxay leeyihiin fansaaro trignomateri isku mid ah. Waxaa dheeri ah, waxaad si toos ah ugu hagi kartaa ardaydu inay soo saaraan saynka, kosaynka iyo taanjantka xaglaha 30° iyo 60° .

Jawaabaha laylis 7.4

1. b. Markaa $45^\circ = \frac{5m}{\ell}$

t. Haddii dhererka hadhku yahay ℓ markaa taan $30^\circ = \frac{5m}{\ell}$

$$\frac{1}{\sqrt{3}} = \frac{5m}{\ell} \quad \ell = 5\sqrt{3}m$$

j. Ka soo qaad dhererka sallaanku inuu yahay kolkaa sayn $45^\circ = \frac{12m}{\ell}$

$$= \frac{\sqrt{2}}{2} = \frac{12m}{\ell}$$

$$\ell = \frac{24}{\sqrt{2}}m$$

$$= 12\sqrt{2}m \approx 16.9706m$$

x. $m(\angle A) = 60^\circ$. Ka dhig balladhka wabiga w . Kolkaa $\tan 60^\circ = \frac{10m}{w}$

$$\sqrt{3} = \frac{10m}{w}$$

$$w = \frac{10m}{\sqrt{3}}$$

$$w = \frac{10\sqrt{3}}{3}$$

$$w = 5.7735$$

Kh. Ka soo qaad balladhka hartu in uu yahay w kolkaa taan $30^\circ = \frac{w}{7km}$

$$\frac{\sqrt{3}}{3} = \frac{w}{7km} \quad w = \frac{7\sqrt{3}}{3} km.$$

2. Dhinacyada la amaara deeyey waxaalagu soo saari karaa xaqqiyooyinka kale ee aan aheyn saamiyada tirignometariga. Tusaale ahaan su, aasha b, $x = 1$ waayo saddex-xagalka waa labaale oo $y = \sqrt{2}$ tioola isticmaalayo aragtiinka baytagras, laakiin hawsha ugu muhiimsan masalooyinka waa kushaqeynta saamiyada tirignomateriga, haddaba ku hogaami ardayda si ay u habeeyaan saamiyada tirignometariga.

b. Sayn $45^\circ = \frac{1}{y}$ taan $45^\circ = \frac{1}{x}$

$$= \frac{1}{\sqrt{2}} = \frac{1}{y} \quad 1 = \frac{1}{x}$$

t. Sayn $45^\circ = \frac{x}{3}$ kosayn $= \frac{y}{3}$

$$\frac{\sqrt{2}}{3} = \frac{x}{3} \quad \frac{\sqrt{2}}{2} = \frac{y}{3}$$

$$x = \frac{3\sqrt{2}}{2} \quad y = \frac{3\sqrt{2}}{2}$$

3. Way caddahay in $m(\angle BAD) = 2\theta$
Haddaba, $2\theta + \theta = 90^\circ$
 $3\theta = 90^\circ$
 $\theta = 30^\circ$

Adeegsashada $\triangle ABC$, $\tan 30^\circ = \frac{4}{x}$

$$\frac{1}{\sqrt{3}} = \frac{4}{x}$$

$$x = 4\sqrt{3}$$

Adeegsashada $\triangle ABD$, $\tan 60^\circ = \frac{BD}{AB}$

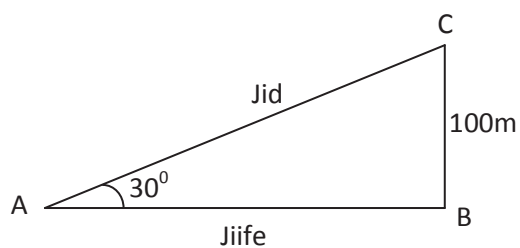
$$\sqrt{3} = \frac{BD}{4\sqrt{3}}$$

$$BD = 4\sqrt{3} \times \sqrt{3} = 4 \times 3 = 12$$

Tani waxay ina siinaysaa $y = 12 - 4 = 8\text{cm}$

Ma tusi kartaa in $AC = DC$?

4 Fiiri Jaantuska 7



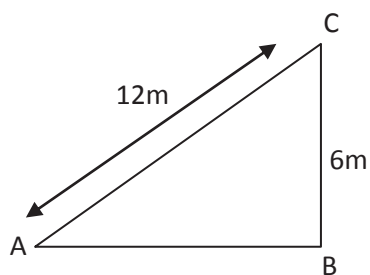
Faraqa u dhexeeya joogagga barta A iyo barta C waa 100m.

$$\sin 30^\circ = \frac{BC}{AC}$$

$$\frac{1}{2} = \frac{100m}{AC}$$

$$AC = 200m$$

5. Ka dhig xagasha u salaanku la sameeyo dhulka ay tahay A.

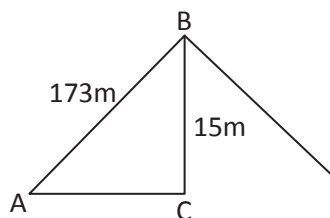


$$\sin A = \frac{6}{12} = \frac{1}{2}$$

$$\text{Sidaa } m(\angle A) = 30^\circ$$

Fiiri jaanka 7

6.



$$\sin A = \frac{15}{173} \approx 0.8671$$

$$\angle A \approx 60^\circ$$

7.3 SHAXAMADA ADKE

Xisooyinka qoondaha: 6 xiso

Waxa ardayga laga rabaa

Dhamaadka cutub-hoosaadkan kolka uu ardaydu waxay awood u yeelan doonaan in ay:

- *Gartaan qaybaha Bayraamidh*
- *Diyaariyaan bayraamidhyo moodeelo ah*
- *Magacaabaan bayraamidhyada noocyo kala duwan iyadoo ku saleynaya salka ay leeyihiin*
- *Gartaan qaybaha toobin*
- *Diyaariyaan toobino moodeel ah.*

Erayo

- Shaxamada adke, Bayraamidh, Toobin, sal, joog, gees, geeska dadabta, wajiga dadabta, waji,

Hordhac

Cinwaankan wuxu ku lug leeyahay sawiridda iyo ka diyaarinta waraaqo ama walaxo balaastik ah muunadaha shaxannada adke ee bayraamidhyo iyo toobinno.

Ardaydu waxay aqoon u leeyihiin shaxannada adke sida biriisamyo iyo dhululubooyin. Waxa kale oo iyana ay yaqaanaan walxaha qaar leh muuqa bayraamidh ama toobin. Mawduucan waxa lagaa filayaa inaad barto qaybaha iyo magacyada bayraamidh quman iyo toobin goobeed quman. Mugga iyo bed-duleedku kuma jiro.

Hawlgalada iyo shaqo-kooxeedyada waxa loo qorsheeyey si loo baro adkeyaashan. Waxa raacsan, tusaalooyin adduunka xaqiiqa ku ah kuwan ku habboon kuna filan.

Jawaabaha shaqo-kooxeedka 7.4

Ardaydu waxay yaqaanaan masalaha ama saliyada fidsan. Howshaadu waa inaad dhex marto oo aad fiiriso inay jiraan arday aan dhisi Karayn Muunadaha. Ugu dambeyn bayramidhyo si fiican u habaysan qaar ah u door oo tus fasalka.

1. Nooc adke bayraamidh ah.
2. Ardayda ku xiisogeli inay xariiqaha dhibic-dhibicda ah ugu isticmaalaan xariijimaha dhinacyada dambe sida ka lagu siiyey hawlgalka xiga.

Jawaaba hawlgal 7.7

1. Tani waxa lagaga jawaabi karaa afka l,

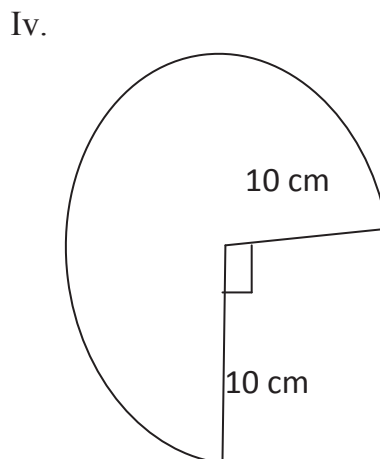
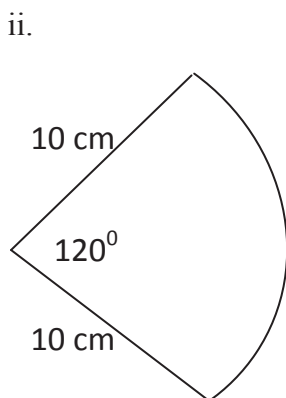
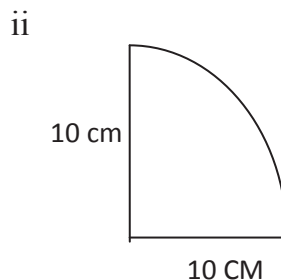
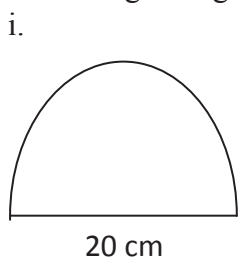
b. 4	t. 5	j. 6
------	------	------

2. b. Bayraamidhka qaabka saddexagal leh waji kasta ayaa noqon kara sal.
t. Afordhinaclaha BEFG ayaa ah salka
j. Shan dhinaclaha ABCDE waa salka.
3. Geesaha V, P iyo T waa baraha aan ahayn salaxa salka
4. Ka codso ardayda qaarkood inay sharaxaan bayraamidh, oo dhamaadkana si habsan adigu ugu sharax.

7.3.2 Toobinno

Jawaabta shaqo-kooxeed 7.5

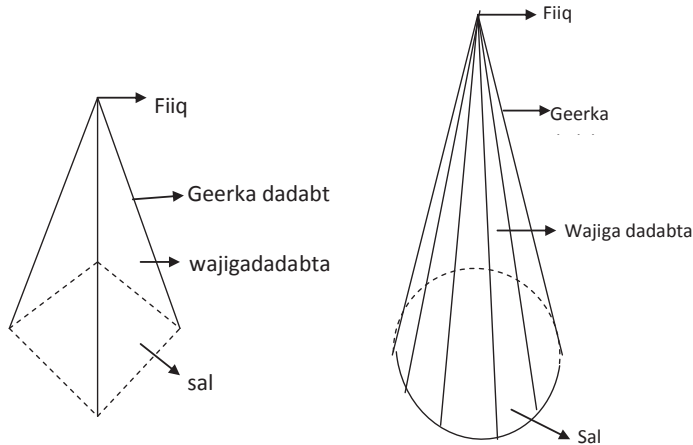
1. Ka caawi ardayda si ay u maleeyaannooca adkaha samaysma kolka salka bayraamidhku yahay bed goodbeed. Waxa suuragal ah in ardayda qaar ay baraamidh laga shaqaynayo bedalaan iyagoo gees dadab toosan ama wajiyada dadaba ay waji xoodan ka dhigaan. Natiijada adkaha soo baxay waa toobin.
2. Ku dhiirigali ardayda si ay u sawiraan goobooyin oo ayna uga gooyaan si taxadirleh goob –gobolka.



3. U sheeg ardaydu inay koor giraangiriyaan goob-gabala oo ay cabbiraan gacamada.
4. U xul ardayda qaar ah si ay muunadaha u tusaan fasalka.
5. Fursad u sii ardaydu si moodeelada ugu sharaxaan ereyadood. Ka dib sii qeexda toobin

Laylis 7.5

1. Ku dhiirigali ardayda inay sawiraan toobin la ogyahay. Ka codso ardayda qaarkood inay toobinka u muujiyaan fasalka.
2. b. t.



3. 4 kolka salku yahay bed saddexagal ah
4. Wajiyada dadban ee bayraamidh qaabsan waa saddexaglo labaaaleyaal ah.

Jawaabaha layliska guud

1. Adeegso Aragtiinka Baytogradas si looga jaawaabo su'aasha 1
- b. $C^2 = 1^2 + 2^2$
 $= 5$
 $C = \sqrt{5}$
- J. $x^2 + (2\sqrt{3})^2 = (3\sqrt{3})^2$
 $x^2 + 4 \times 3 = 9 \times 3$
 $x^2 + 12 = 27$
 $x^2 = 15$
 $x = \sqrt{15}$
- Kh. $C^2 = (\sqrt{3})^2 + (5)^2$
 $= 28$
 $C = \sqrt{28}$
 $C = 2\sqrt{7}$
- t. $a^2 + 12^2 = 37^2$
 $a^2 = 37^2 - 12^2 = 1369 - 144 = 1225$
 $A = 35$
- x. $1^2 + p^2 = (1.25)^2$
 $1 + p^2 = 1.5625$
 $p^2 = 0.5625$
 $p = 0.75$
- d. afardhinacluhu waa qardhaas xaglagooyeyaasha qardhaastu way isku qotomaan.
Haddaba $x^2 = 4^2 + 3^2$
 $= 25$
 $x = 5$

$$r. \quad \tan 45^\circ = \frac{a}{4} t$$

$$1 = \frac{a}{4}$$

$$a = 4$$

$$\sin 45^\circ = \frac{a}{c}$$

$$\frac{\sqrt{2}}{2} = \frac{4}{c}$$

$$c = 4 \times \frac{2}{\sqrt{2}}$$

$$C = \frac{8}{\sqrt{2}} \text{ ama } 4\sqrt{2}$$

$$s. \quad \sin 30^\circ = \frac{a}{10}$$

$$\frac{1}{2} = \frac{a}{10}$$

$$\cos 30^\circ = \frac{b}{10}$$

$$\frac{\sqrt{3}}{2} = \frac{b}{10}$$

$$b = 5\sqrt{3}$$

$$1. \quad i. \quad \tan 60^\circ = \frac{a}{1}$$

$$\sqrt{3} = a$$

$$a = \sqrt{3}$$

$$\cos 60^\circ = \frac{1}{c}$$

$$\frac{1}{2} = \frac{1}{c}$$

$$c = 2$$

2. kaga jawaab su'aalaha b iyo t adoo adeegsanaya Aragtiin ka yukliidh

$$b. \quad x^2 = 1 \times (1+3)$$

$$= 4$$

$$x = 2$$

$$t. \quad 4^2 = 10x$$

$$16 = 10x$$

$$x = 1.6$$

$$h^2 = 1 \times 3$$

$$h = \sqrt{3}$$

$$y^2 = 1.6(1.6+10)$$

$$y^2 = 18.56$$

$$y = \sqrt{1.56}$$

$$\approx 4.3081$$

$$z^2 = 10(10+1.6)$$

$$= 116$$

$$z = \sqrt{116}$$

$$= 2\sqrt{29}$$

j. su'aalaha j iyo x, kolka hore Aragtiinka Baytogras Kadibna Aragtiinka yukhiidh.

$$(x + y)^2 = 3^2 + 4^2$$

$$(x + y)^2 = 25$$

$$x + y = 5$$

u adeegs ashada Aragtiinka yukliidh

$$3^2 = x(x + y)$$

$$3^2 = x(5)$$

$$x = \frac{9}{5}$$

$$y = 5 - x = 5 - \frac{9}{5} = \frac{16}{5}$$

$$h^2 = xy = \frac{9}{5} \times \frac{16}{5}$$

$$h = \frac{3 \times 4}{5}$$

$$h = \frac{12}{5}$$

$$\text{x. } (x + y)^2 = (24)^2 + 7^2$$

$$= 625$$

$$x + y = 25$$

$$7^2 = y(x + y)$$

$$49 = 25y$$

$$y = \frac{49}{25}$$

$$x = 25 - \frac{49}{25} = \frac{576}{25}$$

$$h^2 = xy$$

$$= \frac{576}{25} \times \frac{49}{25}$$

$$h = \frac{24 \times 7}{25} = \frac{168}{25}$$

$$\text{Kh. } 4^2 = x(x + 3x)$$

$$16 = 4x^2$$

$$x = 2$$

$$3x = 6$$

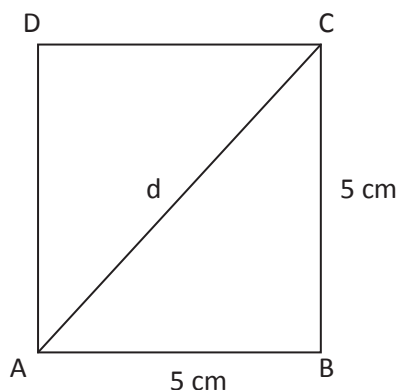
$$y^2 = 3 \times (x + 3x)$$

$$y^2 = 6(2 + 6)$$

$$y^2 = 48$$

$$y = 4\sqrt{3}$$

3.



Ka dhig ABCD labajibbaarane oo dhinac kasta yahay 5cm. Ka dhig xaglagooyuhu yahay d.

$$\text{Kolkaa } d^2 = (5 \text{ cm})^2 + (5 \text{ cm})^2$$

$$= 50 \text{ cm}^2$$

$$d = 5\sqrt{2} \text{ cm}$$

4. Ka dhig dhinaca labajibbaararnaha leh xaglagooyaha 12 cm yahay x. kolkaa

$$x^2 + x^2 = (12 \text{ cm})^2$$

$$2x^2 = 144 \text{ cm}^2$$

$$x = 6\sqrt{2} \text{ cm}$$

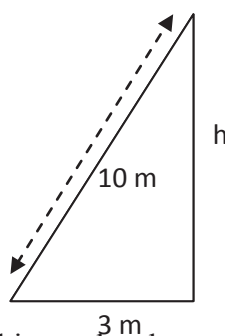
5. Ka soo qaad xaglagooyaha laydiga leh dhinacyada 3cm iyo 7cm u yahay d. kolkaa

$$d^2 = (3 \text{ cm})^2 + (7 \text{ cm})^2$$

$$= 9 \text{ cm}^2 + 49 \text{ cm}^2$$

$$d = \sqrt{58} \text{ cm}$$

6. Kolka hore sawir salaam ku tiirsan darbi qotoma. Waxaadku diyaarin kartaa jaarti darbiga la sudho.



Ka soo qaad dhererka joogga darbiga salaamku gaadhay tahay h. Fiiri jaantuska 7.

$$h^2 + (3 \text{ m})^2 = (10 \text{ m})^2$$

$$h^2 + 9 \text{ m}^2 = 10 \text{ m}^2$$

$$h^2 = 9 \text{ m}^2$$

$$h = \sqrt{9} \text{ m} \approx 9.5394 \text{ m}$$

7. Xaglagooyeyaasha qardhaastu way isku qotomaan islamarkaa na way is qaybshaan. Fiiri jaantuska 7 ka dhig $AC = 8\text{cm}$ islamarkaa $BD = 6\text{cm}$

$$CD^2 = CE^2 + DE^2$$

$$CD^2 = \left(\frac{1}{2}AC\right)^2 + \left(\frac{1}{2}BD\right)^2$$

$$= (4\text{cm})^2 + \left(\frac{1}{2}BD\right)^2$$

$$= (4\text{cm})^2 + (3\text{cm})^2$$

$$= 16\text{cm}^2 + 9\text{cm}^2$$

$$= 25\text{cm}^2 \Rightarrow CD = 5\text{cm}$$

Wareegga ABCD waa $4DC = 20\text{cm}$

8. Ka soo qaad dhererka shakaal c , addinka ugu gaabana ka dhig kolkaa

$$c = a + 4$$

$$a^2 + 8^2 = c^2$$

$$a^2 + 64 = (a + 4)^2$$

$$a^2 + 64 = a^2 + 8a + 16$$

$$8a = 48$$

$$a = 6$$

$$c = 6 + 4 = 10$$

Wareegga saddexagalku waa $(6 + 8 + 10)\text{cm} = 24\text{cm}$

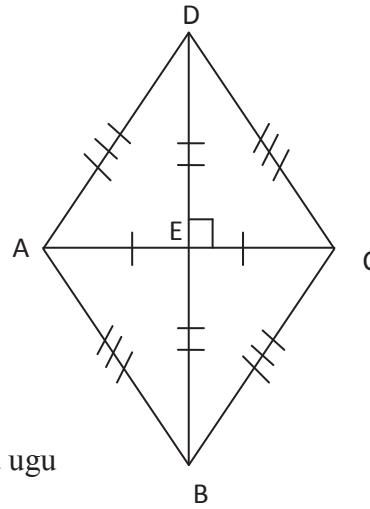
9. Ka dhig dhererka harada k , kolkaa

$$k^2 = 100^2 + 100^2$$

$$k^2 = 2 \times 100^2$$

$$k = 100\sqrt{2}$$

$$\approx 141.4214$$



Shaqada mashruuc

Ka codso ardaydu inay muujiyaan sawirka walaxda ay cabbirayaan baladhkeeda ama dhererkeeda.

Ku dhiirigali inay ku soo bandhigaan shaqada fasalka, u dooro meel deggan haddii kale agagaarka dugsiga u isticmaal.

Ku dhiirigali si ay ugu diyaariyaan jaarti su'aalaha 10 iyo 11 ayna u tusaan fasalka. Uga dooro shaqooyinka ugu fiicansi waxbarasha mustaqbalka dambe loogu isticmaalo.

14. Si loo baro dhinac salka bayramidh waxa jira waji dadab la gudboon.

b. 9 t. 20 j. n

15. y

16. Haddii salka bayraamidh laga dhigo ku goobo ah kolkaa, adkuhu wuxuu noqon toobin.

MUQARARKA XISAABTA FASALKA 8^{AAD}

**Waxaa Tarjumay
Mr. Cabdisalaad Maxed**

**Muqararka
Xisaabta fasalka 8^{aad}**

HORDHAC

Xisaabtu waa Indha-indhaynta, muujinta iyo Baadhitaanka susunta (Hab-yaallada) iyo xidhiidhaha ka dhexeeya walxaha xisaabeed iyo Aragtida.

Barashada xisaabtu waa in ay kobcisaa kartida Ardayda eek u wajaha:-

- In ay xaaladdaha Jira ka dhex Arkaan xisaabta isla markaana ay doortaan xisaabta ku habboon xaaladdahaas.
- In ay si loojig ah, hal-Abuur leh, isla markaana xeeladaysan ay uga shaqaysiiyaan maskaxdooda ama ay u Fekeraan.
- In ay Qorsheeyaan, Baadhaan isla markaana sameeyaan go'aan ka saabsan Heerarka saxnimada.
- In ay si xaqiiqo ahaan ah u sababeegaan, una Faaqidaan Tallaabooyinka suurtagalka ah (options) isla markaana ay mskaxda ku hayaan cawwaaqibka iyo Dhibaatooyinka Goban-qaadashada.

Shaxda soo socota waxay muujinaysaa Talobixinnada (Talo soo jeedinta) ku saabsan Hababka mabaadiida Baris-Barashada Firfircoon ee lagu hanan karo Barashada xisaabta heerka Fasalka 8^{aad}, iyada oo maskaxda lagu haynayo Marxaladdaha Horumarinta ardayda ee hadda Taagan ama hadda socota.

Mabaadida Barashada	Xeeladdaha ay Bareyaashu u adeegsan karaan Hirgelinta Mabaadi,daas.
<p><u>Fursaddaha wax loo baran karo</u> Khibraddaha Barashadu waa in ay Ardayda Awoodsiisaa u Fiirsashada iyo ku Celcelinta Ficil ahaaneed ee Hanaanka, xirfaddaha, Tarminta (waxa la soo saarayo) iyo Qiimaha dhabta ah ee laga rajeynayo Ardayda.</p>	<ul style="list-style-type: none"> ▪ Qaabaynta (To model) Hanaanka xisaabeed iyo Furfurista ma'alooyinka (xallinta Dhibaatooyinka) ee loogu Talagalay Ardayda, u adeegso xeeladdaha kor u qaadaya ka shaqaysiinta Maskaxda (Think-Aloud “Strategies”). ▪ Sii Ardayda Fursaddo u saamaxaya in ay Qeexaan, sharraxaan ama sabsabeeyaan waxa la doonayo. ▪ Sii Ardayda Fursaddo u saamaxaya in ay xisaabta u adeegsadaan xallinta Dhibaatada, Raadinta Hab-yaallada (pattern Finding) iyo Go'aan – qaadashada ee xaaladdaha soo Foodsaara. ▪ Sii Ardayda Fursaddo u saamaxaya in ay khibrad ka helaan Hanaanka ay xisaab ahaan u shaqaynayaan. ▪ Xaqiiji in Ardayda ay haystaan Fursaddo ay ku kobcinayaan kalsoonidooda in ay xirfaddaha xisaabeed ku dabbakhaan xaaladdaha kala duwan ee degaankooda ka jira.
<p><u>Isku Xidhiida iyo</u> Khibraddaha Barashadu waa in ay noqotaa mid isku xidhaysa Aqoonta iyo xirfaddihii</p>	<ul style="list-style-type: none"> ▪ Samee isku xidhid ka dhexaysa xisaabta la doonayo Ardaydu in ay bartaan iyo Aqoon toodii hore iyo xaaladda hooda

Mabaadida Barashada	Xeeladdaha ay Bareyaashu u adeegsan karaan Hirgelinta Mabaadi,daas.
<p>hore ee Ardayda iyo Aqoonta iyo Xirfaddaha cusub ee labarayo Ardayda iyada oo loo sii fidinayo hababkooda Fekeridda & Waxqabadkooda</p>	<p>shaqsiyadeed ee Ardayda.</p> <ul style="list-style-type: none"> ▪ Isku xidh xisaabta ay Ardaydu Baranayaan iyo Maaddooyinka kale ee Manhajka. ▪ Kula Halgan Ardayda in ay qabatimaan Dariiqooyinka xisaabta isla markaana ay ku dabbakhaan xaaladdaha ka jira Deegaankooda. ▪ Ka caawi in ay Fursad u helaan isgaarsiinta macluumaadka Farsamada casriga ah (ICT) si ay u cabbiraan karaankooda xisaabeed iyo xadadkeedaha.
<p><u>Falalaka iyo Kabaaraandegidda</u> Khibraddaha Barashadu waa in ay noqdaan kuwo macno buuxa sameynaya Isla markaana Ardayda ku dhiirigelinaya in ay si Ficil ah u qabtaan kana Baaraandegaan waxa la barayo.</p>	<ul style="list-style-type: none"> ▪ Sii Ardayda Fursaddo u saamaxaya in ay Falanqeeyaan Xeeladdaha xisaabeed ee lagu guulaysan karo iyo kuwa aan lagu guulaysan Karin. ▪ Sii Ardayda Fursaddo u saamaxaya in ay ka Baaraandegaan isla markaana ku falanqeeyaan Horuka coda ama Guulaha ay xisaabta ka gaadheen. ▪ Samee shuruuddaha Qiimeynta xisaabta, isla markaana Abuur Fursaddo u saamaxaya Ardayda in ay Naftooda Qiimeeyaan.
<p><u>Xiisogelinta iyo Bar-Tilmaameedka</u> Khibraddaha Barashadu waa in ay noqdaan kuwo xiisogelinaya Ardayd isla markaana ay noqdaan kuwo si cad ugu hagaya Bar-Tilmaameedkooda.</p>	<ul style="list-style-type: none"> ▪ U Ifitiimi Dabbakhaaddaha Nolosha dhabta ah (sida xisaabta loogu dabbakho Nolosha dhabta ah) iyo Faa'iiddooyinka Mustaqbalka ee xisaabta ay Ardaydu hadda baranayaan. ▪ Isku xidh Barashada xisaabtu Faa'iiddooyinka ay u leedahay Nolosha Ardayda iyo bay'adda Deggaankoodaba. ▪ Iskuxidh Barashada xisaabtu Faa'iiddooyinka ay u leedahay Mustaqbalka waxbarashooda Jaamacadeed iyo shaqooyinka ay heli doonaan.
<p><u>Waxbarasho loo dhanyahay</u> Khibraddaha Barashadu waa in ay Ixtiraamtaa isla markaana ay noqotaa mid ay u dhan yihiin Dhammaan Noocyada kala duwan ee Ardayda (Farqiyada u dhexeeya Ardayda)</p>	<ul style="list-style-type: none"> ▪ Naqshadee (Design) hawlgalo xisaabeed oo leh Qaabab Barasho oo ku kala duwan styles Qiimaha (values), Jenderka (Gender), kartida, xiisaha, Dhaqannada iyo taariikh – Nololeedka Qoyska. ▪ Naqshadee ama diyaari Hawlgalle xisaabeed kuwaas oo aad ku qaadanayso (ku xulaynayo) kala duwaan shaha Ardayda ee korriinkooda Maskaxeed, Jidheed iyo lab-Lakacooda.

Mabaadida Barashada	Xeeladdaha ay Bareyaashu u adeegsan karaan Hirgelinta Mabaadi,daas.
<p><u>Kelinimada iyo Iskaashiga</u> Khibraddaha Barashadu waa in ay Ardayda ku dhiirigelisaa in ay wax u bartaan si keli-keli ah iyo si Iskaashi ah labadaba.</p>	<ul style="list-style-type: none"> ▪ Naqshadaynta khibraddo Barasho oo Ardayda u ogolaanaya in Qaar ka mid ah ay ku kala duwanaadaan habka ay wax u baranayaan iyo Habka ay ugu siqayaan hawlgallada xisaabta. ▪ Naqshadaynta khibraddo Barasho oo ardayda u ogolaanaya in ay si Iskaashi ah ardayda kale uga wada shaqeeyaan xisaabta.
<p><u>Goob Deggan oo Taageero leh</u> Habaynta /Qaabaynta Dugsiga iyo Fasalkuba waa in ay noqdaan kuwo xaqiijinaya Badbaadada Ardayda isla markaana ka Taageeraya Barashada Firfircoon.</p>	<ul style="list-style-type: none"> ▪ Dhis Fasal badbaadsan oo u suurtagel in kara Ardayda Is-cisayn iyo isu dulqaadasho. ▪ Ku dhiirigeli Ardayda in qaataan Ismiidaaminta ku habboon ee xisaabta. ▪ Ku dhiirigeli Ardayda in ay si Firfircooni leh u aqoonsadaan Guulaha iyo Horu-kaca ay ka gaadheen xisaabta. ▪ Ku dhiirigeli Ardayda in ay qaataan in khaladaadkoodu uu yahay Fursaddo waxbaasho, Balse aan u ahayn calaamaddaha Guuldarada. ▪ Abaabul Axdi-Qarameedyada (policies) Dugsiga ee ka caawinaya Aragtida Fiican ee Dhinaca xisaabta.

Ujeeddooyinka Barashada

Xisaabta Fasalka

Ardaydu marka ay dhammeeyaan Xisaabta Fasalka 8aad kadib waa in ay Awood u yeelan karaan: _

- Fududaynta Tibaaxaha Al-Jabrada ah.
- Furfurista mas'alooyinka khuseeya Nolosha dhabta (xallinta Dhibaatooyinka Nolosha dhabta) ah iyaga oo adeegsanaya Doorsoomeyaasha.
- Iskudhufashada laba-Tibxaale lagu dhufanayo hal-Tibxaale iyo Laba-Tibxaale.
- Soo saarista Isir-weynaha ay wadaagaan Tibaaxaha Al-Jabrada ah.
- Furfurista Isle'egyada iyo Dheelliyada Toosan iyaga oo adeegsanaya xeerarka iskubedelidda.
- Sawiridda xarriiq ka dusta unugga (origin) oo Isle'egteeda la siiyey.
- Soo saaridda (Dhisidda) Isle'egta xarriiq Bar-kulannadeeda la siiyey.
- Soo saaridda Labajibbaarka iyo Saddexjibbaarka Tirooyinka.
- Soo saaridda xidid-Labajibbaarka iyo xidid – Saddex – Jibbaarka ee Tirooyinka Laba Jibbaaran iyo kuwa saddexjibbaaran sida ay u kala horreeyaan.

- Raadinta xidid – labajibbaarka Qiyaasta Tirada ugu dhow ee Tirooyinka, iyada oo adeegsanaya shaxda xidid-labajibbaarka Tirooyinka.
- Sheegidda xaaladdaha ay saddexagalladu ku noqon karaan saddexagallo isku mid ah.
- Adeegsiga Tijaabooyinka Isu-ekaanshaha (isku mid ahaanshaha) si ay u hubiyaan in laba saddexagal oo la siiyey ay isku mid yihiin (Isu egyihiin) iyo in kale.
- Muujinta xidhiidhka ay yeelan karaan xarriiqaha iyo Goobooyinka.
- Adeegsiga xaqiiqooyinka Aasaasiga ah ee ku saabsan xagal-xudduneedyada iyo xagal – Geesyada iyo xaglaha ay sameeyaan Boqonnada Isgoynaya si ay u Furfuraan mas’aloooyinka la xidhiidha.
- Sharxidda Dhacdo, muunadda – Dhacdo, iyo Itimaalka Dhacdooyinka Fudud.
- Xisaabinta Itimaallada Dhacdooyinka Fudud.
- Fahamka Fikraddaha (macnaha) aasaasiga ah ee ku saabsan saddexagallada Qumman.
- Dabba khidda Aragtiinnada muhiimka ah ee ku saabsan saddexagallada Qumman si ay ugu Furfuraan Mas’aloooyinka la xidhiidha Saddexagallada Qumman.
- Kasbashada Aqoonta mabaadi’da Aasaagiga ah ee saamiyada Tirignoomatariga.
- Dabbakhidda saamiyada Tirignoomatariga ah ee 30⁰, 45⁰ iyo 60⁰. si ay u furfur aan mas’aloooyinka la xidhiidha.
- Soo soocidda Qaybaha kala duwan ee Bayraamidhka iyo Toobinka.
- Diyaarinta Moodheellada Bayraamidhka iyo Toobinka.

Cutubka 1^{AAD}: Labajibbaarka, Xidid-Labajibbararka Saddexjibbaarka**Iyo Xidid – Saddexjibbaarka (20 Xisadood)****Ujeeddooyinka Guud ee Cutubkan:**

Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Fahamka Macnaha Labajibbaarka iyo Xidid- Labajibbaarka, Saddexjibbaarka iyo xidid – Saddexjibbaarka.
- Soo saaridda xidid labajibbaarka Tirooyinka labajibbaaran.
- Raadinta Qiyaasta Tirada ugu dhow xidid – Labajibbaarka Tirooyinka, iyaga oo adeegsanaya shaxda xidid – labajibbaarka.
- Soo saaridda Saddex-Jibbaarka Tirooyinka.
- Soo saaridda xidid – Saddexjibbaarka Tirooyinka Saddexjibbaaran.

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>Ardaydu waa in ay Awood u yeelan kartaa:-</p> <ul style="list-style-type: none"> ▪ Soo saaridda Labajibbaarka Tiro 	<p>1.LABAJIB BAARKA , XIDID– LABAJIB BAARKA ;SADDEX JIBBAAR KA iyo XIDID – SADDEX JIBBAAR KA.</p> <p>1.1. Labajibbaarka Tirada (5 Xiso) Labajibbaarka Tirooyinka Lakabka leh.</p>	<ul style="list-style-type: none"> ▪ Ku hoggaami Ardayda in ay Naqtiin ku sameeyaan iskudhufashada laba Tiro oo isku mid ah sida $2 \times 2 = 4$, $3 \times 3 = 9$, $4 \times 4 = 16$ Ka dibna ay xaqiijiyaan in Taasi tahay x^2 waayo $x \cdot x = x^2$ loona Akhriyo “x” kujibbaaran 2”. ▪ Ka caawi Ardayda in ay ka Fogaadaan Fahamka khaldan, kaas oo ah in a^2 ay tahay $2a$ laakiin ma aha <p>Tusaale : $3 \times 3 = 3^2$ (3 ku Jibbaaran 2) = $9 \times 5 = 5^2 = 25$ $7 \times 7 = 7^2 = 49$</p>	<ul style="list-style-type: none"> ▪ Weydii aralayda in ay Tiraab ahaan Akhriyaan kuna siiyaan Macnaha Labajibbaarka Tirooyinka.
<ul style="list-style-type: none"> ▪ Raadinta Labajibbaarka Tiro iyaga oo adeegsanaya shaxda Labajibbaarad 	<p>Adeegsiga Shaxda Qiimaha Labajibbaarka</p>	<ul style="list-style-type: none"> ▪ Ku hoggaami Ardayda in ay soo gunaanadaan in Tiro labajibbaaran uu macnaheedu yahay Tiradaas lafteeda oo laba Jeer la isku dhuftay <p>Tusaale :-</p>	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay soo saaraan labajibbaarka Tirooyinka iyaga oo adeegsanaya:- b)Taranta Tirada

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
a		$5^2 = 5 \times 5 = 25$ <ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay labajibbaarka Tiro ka raadiyaan shaxda labajibbaarka Tirooyinka. Tusaale : Raadi Labajibbaarka 4.72 1. Jog-u- Taxa “x” hoosteeda ka Raadi 4.7 2. Jiif-u-Taxa, 4.7 uga dhaqaaq dhinaca midig ilaa aad gaarto Tirada 2. 3. Akhri Tirada halkaas ku qoran waa 22.28. Haddii aad labajeer isku dhufato 4.72 waxa aad helaysaa $(4.72)^2 = 4.72 \times 4.72 = 22.2784$ <ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay ku soo gabagabeeyaan in Natiijada ay shaxda ka haleen ay tahay Qiyaasta Tiimaha ugu dhow oo loo qoray Tirada ay xisaabin ayeen. Tusaale ahaan $(4.72)^2 = 22.2784 \approx 22.28$ 	oo laba Jeer la isku dhuftay. t) Ka Raadinta shaxda Qiimaha labajibbaarada Tirooyinka.
<ul style="list-style-type: none"> ▪ Qeexidda xidid-labajibbaarka Tirooyinka Lakabka leh ee aan Tabanaha ahayn (Tirooyinka lakabka leh ee Togan iyo “0”) ▪ Saaridda xidid-labajibaarka Tirooyinka Labajibbaaran 	2.2. Xidid - labajibbaarka Tirooyinka Lakabka leh (8 Xiso) Xidid – Labajibbaarka Tirooyinka Labajibbaaran.	<ul style="list-style-type: none"> ▪ Ka bilow casharkan Naqtiimidda labajibbaaridda Tiro. ▪ Ka caawi Ardayda in ay sharrax ka bixiyaan xidhiidhka ka dhexeeya Labajibbaaridda Tirada iyo ka saaridda xidid-Labajibbaarka Tiradaas, iyaga oo adeegsanaya Tusaaleyaal kala duwan sida b) $2^2 = 2 \times 2 = 4$ \therefore xidid – Labajibbaarka 4 waa 2 t) $3^2 = 3 \times 3 = 9$ \therefore xidid – Labajibbaarka 9 waa 3 J) $5^2 = 5 \times 5 = 25$ \therefore xidid – Labajibbaarka 25 waa 5	

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loobaahan yahay	Tallaabooyinka Qiimeynta
		<ul style="list-style-type: none"> ▪ Ku hoggaami Ardayda in ay gaadhaan Gunaanadka ah in Raadinta xidid-Labajibbaarka Tirooyinku ay tahay Lidka ama Rogaalka labajibbaarka Tirada. ▪ Fursad u sii Ardayda in ay xidid-Labajibaarka Tiro u qeexaan sedan soo socota. Haddii “y” ($y \geq 0$) ay tahay Labajibbaarka “X” ($x \geq 0$) markaa “x” waxaa la yiraahdaa xidid-labajibbaarka “y” waxaana sumad ahaan loo Qorikaraa sedan $x^2 = y \Leftrightarrow x = \sqrt{y}$. ▪ Ku hoggaami Ardayda in ay Isirraynta mutuxan u adeegsadaan Raadinta xidid-Labajibbaaraka Tirooyinka labajibbaaran. Waxa aad Adeegsan kartaa Tusaaleyaal kala duwan oo la mid ah kan Tusaale :- Raadi (ka saar) $\sqrt{196}$ $196 = 2 \times 2 \times 7 \times 7$ Habee Isirrada 196. 196 waa Taranta laba urur oo isku mid ah oo Isirromutuxan ah $196 = (2 \times 7) \times (2 \times 7)$ $196 = 14 \times 14 = 142$ $\therefore \sqrt{196} = \sqrt{14^2} = 14$ Xusuusin:- Shaxda labajibbaarka Tirooyinka iyo shaxda xidid-labajibbaarka Tirooyinka waa in ay ku Jiraan Buugta Ardayda. 	
<ul style="list-style-type: none"> ▪ Ka saaridda xidid-Labajibbaarka Tirada iyaga oo adeegsanaya shaxda xidid- 	<ul style="list-style-type: none"> Adeegsiga shaxda xidid – Labajibbaarka. 	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay sharrax ka bixiyaan Dariiqooyinka (Tallaabooyinka) lagaga saaro xidid-Labajibbaarka Tirada iyaga oo ka Akhrinaya shaxda xidid-Labajibbaarka Tirooyinka. 	<ul style="list-style-type: none"> ▪ Sii Ardayda su’aalo ku saabsan habka shaxda xidid-Labajibbaarka looga. Raadiyo (saaro) Tirada.

Ujeedooyinka gaarka ah ee casharka	Ciwaanad a Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
Labajibbaarka Tirooyinka Lakabka leh.		<p>Tusaale :- Ka saar xididka $\sqrt{24.50}$</p> <ol style="list-style-type: none"> 1. Ku hag Ardayda in ay shaxda xidid 2. Labajibbaarka ka Raadiyaan 24.50. 3. ka caawi Ardayda in ay Jiif-u-Taxa Tiradaas 24.50 uga dhaqaaqaan dhinaca bidix ilaa ay gaadhaan Tirada ah 4.9 kuwaas oo ah labada God ee ugu horreeya xidid-Labajibbaarka 24.50. 4. si ay u soo saaraan godka 3aad, u horsed Ardayda in ay ka bilaabaan 24.50, kadibna u dhaqaaqaan Joog-u-Taxeeda dhinaca kore ilaa ay gaadhaan 5 sidaas awgeed $\sqrt{24.50} = 4.95$ <ul style="list-style-type: none"> ▪ Fursad u sii ardayda in aysheegaan in haddii tirade la siiyey ay waayaan shaxda la siiyey ay qaataan xidid-Labajibbaarka Tirada ugu dhow Tirada la siiyey ee laga heli karo shaxdaas. <p>Tusaale : Raadi $\sqrt{9.950}$</p> <ol style="list-style-type: none"> 1. Ku hoggaami Ardayda in ay shaxda ka raadiyaan Tirada la siiyey oo ah 9.950, Maadaama aan ay shaxdaas ka heli Karin Tiradaas, ka caawi in ay Raad iyaan labada Tiro ee ugu dhow Tiradaas, hal Tiro oo dhinaca midig ah iyo hal Tiro oo dhinaca bidix ah Taas macnaheedu waxaa weeye $9.922 < 9.950 < 9.986$. 2. Ka caawi Ardayda in ay Go'aamiyaan labadaas Tiro tan ugu dhow Tirada la siiyey. 	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay soo saaraan xidid – Labajibbaarka Tirada iyaga oo adeegsanaya shaxda xidid-Labajibbaarka Tirooyinka.

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta																				
		<p>Haddaba Tirada ugu dhow waa 9.922. $\sqrt{9.950} \approx \sqrt{9.922} = 3.15$</p> <ul style="list-style-type: none"> Ku hoggaami ardayda in ay xidid-Labajibbaarka Tirada ka weyn 100 ku Raadiyaan Habkan soo socda:- $\begin{aligned} \text{Tusaale ahaa } \sqrt{2841} &= \\ &= \sqrt{28.41 \times 100} \\ &= \sqrt{28.41} \times \sqrt{100} \\ &= 5.33 \times 10 = 53.3 \end{aligned}$ <p>Xusuusin: Ka caawi Ardayda in ay Tirada la siiyey u Qoraan Taranta Dhufsaneyaasha 100 iyo Tiro kale.</p>																					
<ul style="list-style-type: none"> 	<p>1.3. Saddexjibbaarka iyo xidid-Saddex-Jibbaarka Tiro (7 Xiso)</p>	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 																				
<ul style="list-style-type: none"> Qeexidda saddexjibbaarka Tirada. Soo saaridda saddexjibbaarka Tirada 	<p>1.3.1. Sadde xjibbaar ka Tirada.</p>	<ul style="list-style-type: none"> Ka caawi Ardayda in ay naqtiin ku sameeyaan a^3 macnaheedu in uu yahay $a \times a \times a$ ($a^3 = a \times a \times a$) isla markaana la yiraahdo “a ku jibbaaran 3” ama “a saddexjibbaaran”. Ku hoggaami Ardayda in ay Raadiyaan saddexjibbaarka Qaarka mid ah Tirooyinka idil iyaga oo adeegsanaya shax sida soo socda. <table border="1"> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table> <ul style="list-style-type: none"> Fursad u sii Ardayda in ay Go'aamiyaan in marka la soo saarayo saddex jibbaarka Tiro ay tahay Tiradaas oo saddex 																					<ul style="list-style-type: none"> Weydii aradayda in ay soo saaraan saddexjibbaarka Tirooyinka (kuwaas oo ay ku Jiraan Qaar ka mid ah Jajab yada iyo Jajab-Tobanleyaasha Fudud)

Ujeedooyinka a gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<ul style="list-style-type: none"> ▪ Qeexidda xidid-saddexjibbaarka ▪ Tirade saaridda xidid-Saddexjibbaarka Tirooyinka saddexjibbaaran 	1.3.2. Xidid-Saddexjibbaarka Tiraada	<p>Jeer la isku dhufatay.</p> <ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay Raadiyaan saddexjibbaarka Tiro kadibna ay Raadiyaan weydaarkeeda oo ah xidid-Saddexjibbaarka isla Tiradii. <p>Tusaale :- $53 = 5 \times 5 \times 5 = 125$ saddexjibbaarka 5 waa 125 xidid-saddexjibbaarka 125 waa 5 waayo $5 \times 5 \times 5 = 125$</p> <ul style="list-style-type: none"> ▪ Ku dhiirigeli Ardayda in xidid-saddexjibbaarka Tiro ay u Qeexaan in uu yahay Isir ka mid ah Taranta saddex isir oo isku mid ah oo la isku dhufataya. ▪ Ka caawi Ardayda in ay Qoraan sumadda xidid-Saddexjibbaarka oo ah “$3\sqrt{\quad}$” <p>Tusaale ahaan $3\sqrt{8}$ waxaana loo akhriyaa “xidid – Saddexjibbaarka 8”</p> <ul style="list-style-type: none"> ▪ Ku dhiirigeli Ardayda in ay xidid-Saddexjibbaarka ka saran Tirooyinka Saddexjibbaaran. <p>Tusaale :-</p> $3\sqrt{27} = \sqrt[3]{3 \times 3 \times 3}$ $1) \quad = \sqrt[3]{3^3} = 3 \quad 2)$ $3\sqrt{\frac{64}{125}}$ $= \frac{\sqrt[3]{64}}{\sqrt[3]{125}} = \frac{\sqrt[3]{4 \times 4 \times 4}}{\sqrt[3]{5 \times 5 \times 5}} =$ $\frac{\sqrt[3]{4^3}}{\sqrt[3]{5^3}} = \frac{4}{5}$ <ul style="list-style-type: none"> ▪ Ka caawi ardayda in ay ka shaqeeyaan Mas’aloyinka la xidiidha xidid-saddexjibbaarka <p>Tusaale:-Haddii mugga</p>	<ul style="list-style-type: none"> ▪ Sii Ardayda laylisiyo ah soo saaridda xidid-Saddexjibbaarka Tirooyinka (Tirooyinka saddexjibbaaran) kana hubi shoqadooda. ▪ Weydii Ardayda in ay Adeegsada sumadda xidid-saddexjibbaarka ee ah “$3\sqrt{\quad}$” una Adeegsadaan si sax ah.

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>saddexjibbaarane uu yahay 8m^3, Raadi dhererka cidhifyadiisa.</p> <p>Si aad u Raadiso dhererka cidhifyada 8 u Tibaax Taranta 3 Isir oo isku mid ah kadibna mid qaado</p> $\sqrt[3]{8\text{m}^3}$ $= \sqrt[3]{25\text{m} \times 25\text{m} \times 2\text{m}} \therefore \text{Dhere}$ $= 2\text{m}$ <p>rka cidhif kasta oo ka mid ah cidhifyada saddexjibbaaranahaasi waa 2m.</p>	

CUTUBKA:2^{aad} :ADEEGSIGA DOORSOOMEYAASHA(25 XISADOOD)**Ujeeddooyinka Guud ee Cutubkan:**

Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Furfurista Mas'alooyinka la xidhiidha Nolosha iyaga oo adeegsanaya Doorsoomeyaasha.
- Soo saaridda Taranta Laba-Tibxaale lagu dhufanayo hal-Tibxaale iyo Laba-Tibxaale lagu dhufanayo Laba-Tibxaale kale.
- Soo saaridda Isir-Weynaha ay wadaagaan (I.W.M)

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>Ardaydu waa in ay Awood u yeelan kartaa:-</p> <ul style="list-style-type: none"> ▪ Adeegsiga Doorsoomeyaasha ee Tibaaxidda xidhiidka Aljabrada iyo Joomateriga 	<p>2. ADEEGSIGA DOORSOOMEY AASHA</p> <p>1.1. Tibxaha iyo Tibaaxaha Aljabrada ah (8 Xiso) Adeegsiga Doorsoomeyaasha ee Qaacidooyinka.</p>	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay Naqtiin ku sameeyaan Fikradda (macnaha) Doorsoomeyaasha, Tibxaha iyo Tibaaxaha. ▪ Ku dhiirigeli Ardayda in ay Falanqeeyaan kaalinta ay Doorsoomeyaashu kaga Jiraan xisaabta iyaga oo adeegsanaya Tusaaleyaal. ▪ Ku hoggaami Ardayda in ay sharrax ka bixiyaan xidhiidhada xisaabeed iyaga oo ku macnaynaya Doorsoome. <p>Tusaale:- Bedka Laydiga. -Wareegga koorta</p>	<ul style="list-style-type: none"> ▪ Weydii aralayda in ay weedh-xisaabeedyada Fudud u bedelaan Tibaaxo xisaabeed.
<ul style="list-style-type: none"> ▪ Fududaynta Tibaaxaha Aljabrada ah eel eh bilaha iyo kuwaan Bilaha lahayn 	<p>Doorsoomeyaasha Tibxaha iyo Tibaaxaha</p>	<ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay Naqtiin ku sameeyaan Macnaha Tibxaha isku midka ah iyo Tibxaha aan isku midka ahayn. ▪ Ku hoggaami Ardayda in ay Fududeeyaan Tibaaxaha Aljabrada ah ee la siiyey iyaga oo isu ururinaya Tibaxaha isku midka ah. <p>Tusaale :- Fududee $5x + y - 3x + 2y$ “5x” iyo “3x” waa Tibxo isku mid ah oo</p>	<ul style="list-style-type: none"> ▪ Sii Ardayda laylisyo ku saabsan Fududaynta Tibaaxaha Aljabrada ah eel eh Bilaha.

Ujeedooyin ka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		leh $5x - 3 = 2x$ “y” iyo “2y” waa tibxo isku mid ah oo leh $y + 2y = 3y$ $\therefore 5x + y - 3x + 2y = 2x + 3y$	
<ul style="list-style-type: none"> Furfurista Mas’alooyin ka la xidhiidha Nolosha, iyaga oo adeegsanaya Doorsoomeyaasha. 	U Adeegsiga Doorsoomeyaasha Furfurista Mas’alooyinka	<ul style="list-style-type: none"> Ka caawi Ardayda in ay Furfur aan Mas’alooyinka la xidhiidha Nolosha, iyaga oo adeegsanaya Doorsoomeyaal. <p>Tusaale: Saddex Arday ayaa waxay Qaybsadeen Lacag dhan 3600 Birr. Haddii laba ka mid ah ay Qayb u heleen lacag Isle’eg, Ardayga 3aadna uu 600 Birr dheeryahay labada Arday ee kale. Markaa Raadi Qaybta uu Arday kasta qaatay?</p> <p>Furfuris:- ka soo qaad lacagta uu Qaybta u helay mid ka mid ah labada Arday in ay tahay “x”. markaa lacagta uu Qaybta u helay Ardayga 3aad waa $x + 600$. sidaas awgeed</p> $x + x + (x + 600) = 3600$ $3x + 600 = 3600$ $3x + 600 - 600 = 3600 - 600$ $3x = 3000$ $\frac{3x}{3} = \frac{3000}{3}$ $x = 1000$ <p>\therefore Labada Arday, Arday kasta wuxuu Qayb u helay 1000 Birr, Ardayga 3aadna wuxuu qayb u helay 1600 Birr.</p>	<ul style="list-style-type: none"> Sii Ardayda Laylisyo ku saabsan Mas’alooyinka la xidhiidha Nolosha dlabata ah ee loo Tibaaxi karo Doorsoomeyaasha.
<ul style="list-style-type: none"> Soo saaridda Taranta Hal-Tibix iyo Laba-Tibxaale 	2.2. Isku dhufashada Laba-Tibxaaleyaasha (7 Xiso) 2.2.1. Iskudhufashada Hal-Tibix iyo laba -	<ul style="list-style-type: none"> Ku dhiirigeli Ardayda in ay Fududeeyaan Tibaaxaha Aljabrada ah Tusaale ahaan. 1) Fududee $4(x + 3) - 4(x + 3)$ macnaheedu	<ul style="list-style-type: none"> Sii Ardayda Laylisyo shaqo Fasal iyo shaqo Guri ah oo ku saabsan soo saaridda

Ujeedooyin ka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
	Tibxaale	<p>waxaa weeye “$x + 3$” oo afar Jeer la isugeeyey. $4(x+3) = (x+3)+(x+3)+(x+3)+(x+3)$</p> <p>2) Fududee $2x(3y - 5x)$ $2x(3y - 5x) = (2x)(3y) - (2x)(5x) = 6xy - 10x^2$</p> <p>3) Fududee $8x(4y + 3x)$ $8x(4y + 3x) = (8x)(4y) + (8x)(3x)$ $= 32xy + 24x^2$</p> <ul style="list-style-type: none"> ▪ Ku hoggaami Ardayda in ay gaadhaan Go'aankan ah. $a(b + c) = ab + ac$ 	Taranta Hal-Tibxaale Adaguna ka hubi shaqadooda.
<ul style="list-style-type: none"> ▪ Soo saaridda Taranta Laba-Tibxaale lagu dhuftay laba-Tibxaale kale 	Iskudhufashada Laba Labo-Tibxaale.	<ul style="list-style-type: none"> ▪ Ku hoggaami Ardayda in ay soo saaraan Taranta laba laba-Tibxaale, iyaga oo adeegsanaya xeerka kala dhigidda Isku dhufashada ee Isugeynta $(a + b) \times (c + d) = a \times c + axd + b \times c + b \times d$ ▪ Ku hag Ardayda in ay Fududeeyaan Taranta labada lab-Tibxaale. Tusaale :- $(2x - y)(5m - 3n) = (2x)(5m) - (2x)(3n) - (y)(5m) + (y)(3n)$ $= 10xm - 6xn - 5yn + 3yn$ Tusaale: $(3a + 4b)(2ab - 5a^2) = (3a)(2ab) - (3a)(5a^2) + (4b)(2ab) - (4b)(5a^2) = (6a^2b - 15a^3 + 8ab^2 - 20a^2b) = 6a^2b - 15a^3 + 8ab^2 - 20a^2b = -14a^2b - 15a^3 + 8ab^2$ 	<ul style="list-style-type: none"> ▪ Sii Ardayda Laylisyo ku saabsan soo saaridda Taranta Laba Labo-Tibxaale.
<ul style="list-style-type: none"> ▪ Raadinta Isirweynaha ay wadaagaan Tibaaxaha Alijabmada ah. ▪ Isirraynta 	2.3. Isir –weynaha ay wadaagaan (10 Xiso)	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay soo saaraan Isirweynaha awadaagaan (i.W.M) Tibaaxaha Aljabrada ah, iyaga oo raacaya Habkan soo socda:- Tusaale: Raadi Isirweynaha ay wadaagaan. 	<ul style="list-style-type: none"> ▪ Weydii Aradyda in ay Tibaaxaha la siiyey ka saaraan Isirka ah Isirweynaha ay wadaagaan ee suurtagalka ah.

Ujeedooyin ka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
Laba-Tibxaaleyaa sha		<p>1) $2a^2x$ iyo $6a^3y^2x^5$ isbar bardhig doorsomeyaasha isku midka ah, kadibna qaado isirka ay wadaagaan.</p> <ul style="list-style-type: none"> - Isir-weynaha ay wadaagaan 2 iyo 6 waa 2 - Jibbaarka ugu weyn ee ay wadaagaan ee Isirka "a" waa a^2 - Jibbaarka ugu weyn ee ay wadaagaan ee Isirka "x" waa "x". - Laakiin "y" ma wadaagaan labada Tibxood. <p>\therefore Isirweynahay wadaagaan $2a^2x$ iyo $6a^3y^2x^5$ waa <u>$2a^2x$</u></p> <p>2) $ax + ay$ iyo $bx + by$ $ax + ay = a(x + y)$ $bx + by = b(x + y)$ \therefore Isir -weynaha ay wadaagaan waa "x + y"</p> <p>3) Isirree $x^2 - 3x$ Isir-weynaha ay wadaagaan x^2 iyo $3x$ waa x $\therefore x^2 - 3x = x(x - 3)$</p>	

CUTUBKA:3^{aad}: ISLE'EGYADA IYO DHEELLIYADA TOOSAN**(30 XISADOOD)****Ujeeddooyinka Guud ee Cutubkan:**

Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Fahamka Fikradda (macnaha) Isle'egyada iyo Dheelliyada.
- Kobcinta xirfaddahooda ku saabsan Habaynta iyo Furfurista Isle'egyada iyo Dheelliyada Toosan.
- Adeegsiga xeerarka Iskubedelidda Isle'egyada iyo Dheelliyada si loogu Furfuro Mas'alooyinka.
- Sawiridda xarriiq Toosan oo ka dusta unugga (origin) Taas oo Isle'egteeda la siiyey.

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>Ardaydu waa in ay Awood u yeelan kartaa:-</p> <ul style="list-style-type: none"> ▪ Furfurista Isle'egyada Toosan ee Bilaha leh, iyaga oo adeegsanaya Isku bedelidda Isle'egyada isudhigma. 	<p>3. ISLE'EGYADA IYO DHEELLIYADA TOOSAN</p> <p>1.1. Furfurista Isle'egyada Toosan (10 Xiso) Furfurista Isle'egyada Toosan ee ilaha leh.</p>	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay Naqtiin ku sameeyaan Furfurista Isle'egyada Toosan iyaga oo adeegsanaya Iskubedelidda Isle'egyada Isudhigma. ▪ Ku hoggaami Ardayda in ay Falanqeyaan xeerarkan soo socda ee naya Tusaaleyaal dhawr ah. <ul style="list-style-type: none"> 1) $a + (b + c) = a + b + c$ 2) $a - (b + c) = a - b - c$ ▪ Ku dhiirigeli Ardayda in ay xeerarkaas kor ku qoran ku dabbakhaan Furfurista Isle'egyada Toosan. Waxa aad adeegsan kartaa Tusaaleyaal sida. $2x - (x + 2) = 1$ $2x - x - 2 = 1 \text{ -----(ka saarista Bilaha)}$ $2x - 2 = 1$ $x = 3$ ▪ Ka caawi 	<ul style="list-style-type: none"> ▪ Sii Ardayda Laylisyo ku saabsan Furfurista Isle'egyada Toosan ee Bilaha leh. Kadibna Hubi Jawaabahooda.

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>▪ Ardayda in ay dhuuxaan (Bartaan) Fikradda (macnaha) u Horsanaanta iyo isu ururinta Tibxah isku midka ah ee Fududaynta iyo furfurista Isle'egyada Toosan. Waxa aad adeegsan kartaa Tusaaleyaal sida:-</p> <p>Tusaale : $3(2x + 1) = 2x + 7$ $6x + 3 = 2x + 7$ ----- (ka saarista Bilaha) $6x - 2x = 7 - 3$---- (Isu ururinta Tibxaha</p> <p style="text-align: center;">Isku</p> <p>midka ah) $4x = 4$ $X = 1$</p>	
<p>▪ Furufista Isle'egyada Toosan ee Jajbyada leh.</p>	<p>Furfurista Isle'egyada Toosan ee Jajbyada leh</p>	<p>▪ Ku bilow casharkan Naqtiimidda Afarta Xisaabtal ee Jajabyada</p> <p>▪ Ku xiisageli Ardayda in ay si Ficil Isle'egyada Toosan ee ay ku Jiraan Jajabyadu. Waxa aad Adeegsan kartaa Tusaaleyaal kala duwan sida:-</p> <p>1) Furfur $\frac{3}{4}x - 2 = \frac{1}{2}$</p> <p>$4(\frac{3}{4}x - 2) = \frac{3}{4}(4)$ -Labada dhinac kaga</p> <p>Dhufo Dh.y.w Hooseeyyaashu) $3x - 8 = 2$ ----- Fududayn</p> <p>$3x = 10 \Rightarrow x = \frac{10}{3}$</p> <p>2) Furfur $\frac{2}{3}x + \frac{1}{2} = \frac{3x - 5}{6} =$</p> <p>$6(\frac{2}{3}x + \frac{1}{2}) = (\frac{3x - 5}{6})6$</p> <p>$4x + 3 = 3x - 5$</p>	<p>▪ Weydii Ardayda in ay Furfuraan Isle'egyada Toosan ee Jajabyada leh.</p>

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		$4x - 3x = -5 - 3$ $x = -8$	
<ul style="list-style-type: none"> ▪ Furfurista weedh-xisaabeedyada ku saabsan Noloshahabta ah iyada oo la adeegsanayo Isle'egyada Toosan. 	<p>Furfurista Mas'alooyinka, iyada oo la adeegsanayo Isle'egyada Toosan.</p>	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay soo bandhigaan Tallaabooyinka lagu furfuro weedh – xisaabeedyada iyada oo la adeegsanayo Isle'egyada Toosan. Ku waas oo kala ah:- <ol style="list-style-type: none"> 1) Si Fiican u Fahan masalada 2) Taxdhammaan xaddiyada aan la aqoon eek u jira Masalada adiga oo adeegsanaya Doorsoomeyaal (sida 'x', 'y', z, a, b, IWM) 3) Dhis (Deji) Isle'eg muujinaysa xidhiidhka ka dhexeeya xaddiyada lagu siiyey iyo xaddiyada lagu weydiiyey. 4) Furfuri Isle'egta aad dhistay. 5) Hubi Natijada aad soo saartay 6) Ka Jawaab su'aasha/su'aalaha lagugu weydiiyey Masalada. ▪ Ku dhiirigeli Ardayda in ay si ficil ah ugu celceliyaan Furfurista weedhxisaabeedyada ku wajahan Laamaha kala duwan ee xisaabta iyo Nolol-Maal meedka sida Arimaha kala ah:- wax-soo-saarka, cashuuraha, Bangiyada, maaliyada, maalgelinta, HIV/AIDS IWM. 	<ul style="list-style-type: none"> ▪ Sii aradyada laylisyo ku saabsan Noloshahabta ah sida wax-soo-saarka, cashuuraha kaydka, HIV/AIDS I.W.M.
<ul style="list-style-type: none"> ▪ Adeegsiga saxda ah ee calaamaddaha Dheelliga “≥” “≤” ee ku sunaya Furfurista. 	<p>3.2. Furfurista Dheelliyada toosan (10)</p>	<ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay naqtiin ku sameeyaan Furfurista Dheelliyada Toosan eel eh Doorsoomeyaal horgalahoodu Togan yahay. 	<ul style="list-style-type: none"> ▪ Weeydii Ardayda in ay Furfuraan dheelliyada Toosan eel eh Doorsoomeyaal horgalahoodu Taban yihiin kadibna ka Hubi

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>▪ Furfurista Dheelliyada leh Horgale Taban iyaga oo adeegsanaya xeerarka Iskubedelidda Dheelliyada isu dhisma.</p>	<p>Xiso)</p>	<p>▪ Marka aad barto calaamaddahan “\geq” iyo “\leq” kadib ka caawi Ardayda in ay ku jiraan calaamadahaasi. Waxa aad Adeegsan kartaa Tusaaleyaal sida.</p> <p>Tusaale: Furfur Dheelliyadan soo socda Halka $x \in W$.</p> <p>1) $x + 3 > 4$ 2) $x + 3 \geq 4$</p> $x + 3 - 3 > 4 - 3 \quad x + 3 - 3 \geq 4 - 3$ $x > 1 \quad x \geq 1$ <p>Furfuristeedu waa Furfuristeedu 2, 3, 4, 5, Waa 1, 2, 3, 4, 5, ..</p> <p>▪ Ka caawi ardayda in ay la yimaadaan xeerka lagu Furfuro dheelliyada Toosan kaas oo ah “Haddii Tiro Taban oo isku mid ah Dheelliga labadiisa dhinacba lagu dhufto ama loo qayb iyo markaa calaamaddi Dheelligu waa isbedelaysaa waxayna noqonaysaa Lidkeeda, iyaga oo adeegsanaya Tusaaleyaal dhawr ah waxa aad adeegsan kartaa Tusaaleyaal sida:</p> $2 < 3 \text{ ama } 9 > 6$ $(-1) (-2) > (-1) (3) \text{ ama } -2 > -3 \text{ ama } \frac{9}{-3} < \frac{6}{-3}$ $-3 < -2$ <p>▪ Ku dhiirigeli Ardayda in ay Furfurista Dheelliyada Toosan ku dabbakhaan xeerkaas kor ku xusan sida.</p> $-2x \geq x + 6$ $-3x \geq 6 \text{ ----- Ka goo "x"}$	<p>shaqadooda.</p>

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta																						
		Dheelliga labadiisa Dhinacba. $\frac{-3x}{-3} \leq \frac{6}{-3} \quad \text{--u qaybi } -3$ labada dhinacba $x \leq -2$																							
<ul style="list-style-type: none"> ▪ Sawiridda Afarta waaxdoo ee sallaxa Dhidibbada kaarti iyo muujinta unugga (origin) dhidibka “x” iyo Dhidibka “y”. ▪ Ku meelaynta Baraha la siiyey sallaxa Bar-kulannada kartis. ▪ Akhrinta Barkulannada Bar kasta oo ku taal sallaxa Bar-kulannada kaartis. 	3.3. Hab-Dhiska Dhidibbaa da Kaartis. (10 Xiso) 3.3.1. Afarta waaxood ee Bar-kulannada sallaxa ee kaartis.	<ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay Naqtiin ku sameeyaan Habka Fallaarta Tirada loogu Fid iyo xarriiqda Tirada. ▪ Ka caawi Ardayda in ay xaqiiqsadaan in dhidibka “x” iyo dhidibka “y” ay Afar waaxood oo isle’eg u qaybiyaan sallaxa Bar-kullanada. ▪ Ka Taageer ardayda in ay si Ficil ah ugu celceliyaan Habka Baraha loogu muujiyo sallax Bar-ku lannada (Dhidibbada Sallaxa) dushooda. ▪ Fursad u sii Ardayda in ay si Ficil ah ugu celceliyaan Akhrinta Bar-kulanada Bar aha ku muujisan dhidibbada sallaxa dushooda. ▪ Ku hoggaami Ardayda in ay Qeexaan calaamaddaha lammaaneyaasha Horsan (xiy) ee Bar-kulannada waax kasta. Sida ka muuqata sawirkan soo socda:- 	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay soosaaraan Bar-kuanka Baraha lasiiyey. ▪ Weydii Ardayda in ay Akhriyaan Bar-kulanka Bar kasta oo Dhidibbada sallaxa dushooda. 																						
		Waaxda 2aad																							
<ul style="list-style-type: none"> ▪ Sawiridda xarriiqaha Toosan ee Dhidibbada sallaxa ee Isle’egyada sansaantoodu tahay. → y = a 	3.3.2. Bar-kulannada iyo xarriiqda Toosan	<table border="1" style="margin-bottom: 5px;"> <tr> <td>X</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td> </tr> <tr> <td>Y</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td> </tr> </table> <ul style="list-style-type: none"> ▪ Ku bilow casharkan sawiridda shaxda muujinaysa Qiimaha “x” iyo Qiimaha “y” Halka Qiimaha “y” uu yahay mid aan is bedelayn. Adiga oo Taas ka duwaya Fursad u sii 	X	-3	-2	-1	0	1	2	3	4	5	6	Y	3	3	3	3	3	3	3	3	3	3	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay sawiraan xarriiqo ay Isle’eqo ay Isle’egyadoodu yihiin y = a (Xarriiq Jiifta) x = b (Xarriiq Taagan) y = mx (Xarriiq Janjeedha oo kadusta
X	-3	-2	-1	0	1	2	3	4	5	6															
Y	3	3	3	3	3	3	3	3	3	3															

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>→ $x = b$ → $y = mx$</p> <ul style="list-style-type: none"> ▪ Soo saarida Isle'egyada a la xidhiidha Bar-kulannada Lammaan eyaasha Horsan ee la siiyey ▪ Soo saaridda Isle'egta xarriiqda marta 		<p>Ardayda in ay muujiyaan Barahaas, isla markaana ay xaqiiqsadaan dhacaan xarriiq Jiifta. Waxa aad qaadan kartaa Tusaaleyaal kala duwan sida Tusaalaha soo socda.</p> <ul style="list-style-type: none"> ▪ Ku dhiirigeli Ardayda in ay u Fiirsadaan xarriiqdan ah $y = 3$, isla markaana ay yiraahdaan $y = 3$ waa isle'egta xarriiqdaas. ▪ Ka caawi ardayda in ay Gaadhaan Go'aanka ah in $y = a$, halka $a \in Q$, ay tahay Isle'egta xarriiq jiifta (ama ay tahay xarriiq la barbarro ah dhidibka x). ▪ Ku dhiirigeli Ardayda in ay sawiraan xarriiqo ay Isle'egyadoodu yihiin sansaanta $y = a$, Tasaale ahaan Ha sawireen xarriiqahan. <p>b) $y = -1$ t) $y = 2$</p> <ul style="list-style-type: none"> ▪ Ka caawi Ardayda, iyaga oo Tallaabooyinka kore kuwo la mid ah ku sameynaya, xarriiqo Taagan, in ay Gaadhaan Go'aanka ah in $x = b$, Taagan (ama xarriiq la barbarro ah dhidibka y). ▪ Ku dhiirigeli Ardayda in ay sawiraan xarriiq Toosan oo Isle'egteedu tahay sansaanta $x = b$, haka $b \in Q$, Tusaale ahaan xar xarriiqaha Isle'egyadoodu yihiin. <p>b) $x = -3$ t) $x = 5$</p> <ul style="list-style-type: none"> ▪ Ku hoggaami Ardayda in ay Falanqeeyaan saamigalka Qumman ee laba xaddi "x" iyo "y", kadibna ka caawi 	<p>Orijinka halka $a, b, m \in Q$ ee sallaxa Bar-Kulanada ka dibna Hubi shaqadooda.</p> <p>Sii Ardayda urur Lammaaneyaala Horsan ah, kadibna weydii in ay Qoraan Isle'egta marta Bar-kulanada lammaaneyaashaas horsan ee la siiyey (Isle'egta loo baahan yahay waa in ay noqotaa Isle'eg Toosan).</p>

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta														
<p>Baraha Bar-kulannadooda la siiyey.</p>		<p>Ardayda in ay sawiraan xarriiqda Isle'egta sansaanteedu tahay $y = mx$, halka $m \in Q$ iyaga oo Falanqaynaya</p> <p>Tallaabooyinkan soosocda:-</p> <ol style="list-style-type: none"> 1. Samee shaxda Qiimaha "x" 2. Soo saar Qiimaha "y" adiga oo adeegsanaya Isle'egta lagu siiyey ee ah $y = mx$ ($m \in Q$) 3. Muuji Bar-kulanka Barha ay ku kulmaan dhidibka "x" iyo dhidibka "y" 4. Sawir xarriiq Toosan oo ka dusta dhammaan Baraha aad muujisay. <p>Waxa aad qaadan kartaa Tusaaleyaal la mid ah kan soo socda.</p> <p>Tusaale; - Sawir xarriiqda Isle'egteedu tahay $y = 3x$.</p> <table border="1"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td></td> </tr> <tr> <td>y</td> <td>-9</td> <td>-6</td> <td>-3</td> <td>0</td> <td>3</td> <td></td> </tr> </table> <ul style="list-style-type: none"> ▪ Ku dhiirigeli Ardayda in ay Gaadhaan Go'aanka ah in xarriiqda leh Isle'egta sansaanteedu tahay $y = mx$:- → waxay ka dustaa unugga (origin) → Tirada u Taagan "m" waxaa la yiraahdaa Tirada xarriiqda. → Fursad u sii in ay u Fiirsadaan Dabecaddaha xarriiqaha marka $m > 0$ iyo marka $m < 0$. ▪ Ka Taageer ardayda in ay Qoraan Isle'egta xarriiq kasta oo marta Baraha Bar-kulannadoodu yihiin Lammaanyaasha Horsan ee la siiyey. Yaal la mid ah Tusaalahan. <p>Tusaale:- Qor Isle'egta xarriiqda</p>	x	-3	-2	-1	0	1		y	-9	-6	-3	0	3		
x	-3	-2	-1	0	1												
y	-9	-6	-3	0	3												

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>marta Barahan lagu siiyey eek ala ah $(-2, -4)$, $(-1, -2)$, $(0, 0)$, $(1, 2)$, $(2, 4)$, $(3, 6)$</p> <p>→ waxay ku dul dhacaan xarriiq Toosan</p> <p>→ xarriiqdu waxay ka dustaanugga (origin)</p> <p>→ Lammaane kasta Qiimaha “y” waa laba Labka Qiimaha “x”</p> <p>Sidaas awgeed $y = 2x$ waa Isle’egta xarriiqdan</p>	

CUTUBKA:4^{aad} : ISU – EKAANSHAHA SHAXANNADA (25**XISADOOD)****Ujeeddooyinka Guud ee Cutubkan:**

Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Aqoonsiga Fikradda (macnaha) Isu-Ekaanshaha shaxannada iyo Erey-Bixinta la xidhiidhaba.
- Fahamka shuruuddaha (xaaladdaha) ay saddexagalladu ku noqon karaan saddexagallo isu-eg.
- Adeegsiga Tijaabooyinka (Tallaabooyinka) lagu hubiyo Isu-ekaanshaha laba saddexagal.

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>Ardaydu waa in ay Awood u yeelan kartaa:-</p> <ul style="list-style-type: none"> ▪ Soosoocidda shaxannada isu-eg midba kan kale. ▪ Sharxidda macnaha Isu-ekaanshaha shaxannada 	<p>4. ISU – EKAANSHAHA SHAXANNADA</p> <p>4.1. Isu-ekaanshaha shaxannada sallaxa (8 Xiso) Sawiridda iyo Qeexidda isu-ekaanshaha shaxannada .</p>	<ul style="list-style-type: none"> ▪ U horsed Ardayda in ay Falanqeyaan macnaha Isu-ekaanshaha shaxannada , iyaga oo adeegsanaya Moodheellada shaxannada ama walxaha sida leh Qaab isku mid ah Balse xajmigoodu kala duwan yahay. <p>Ka caawi Ardayda iyaga oo koox-koox in ay sawiraan shaxanno Lammaan oo isu-eg oo kala duwan. Isla markaana ay keenaan Tusaaleyaal muujinaya Isu-ekaanshaha shaxannada ee Nolol-maalmeedkooda.</p>	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay Fasalka keenaan shaxanno isawirro Nooca ay doonaan ha ahaadeene muujinaya Isu-ekaansho isla markaana weydii in ay sharrax ka bixayaan sida ay isugu eg yihiin.
<ul style="list-style-type: none"> ▪ Sawiridda shaxan ka ballaadhan shaxanka dhabta ah ee la siiyey, iyaga oo adeegsanaya Isirka Ballaadhinta (weynaynta). 	<p>Saamigallada iyo isir rada weyntaynta iyo yaraynta shaxan la siiyey.</p>	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay Ballaadhiyaan ama yareeyaan shaxan la siiyey, iyaga oo adeegsanaya Isirrada weynaynta ama yareynta. ▪ Ka Taageer ardayda in ay Gaadheaan Go'aan yareyntu uu yahay ma doorsoome aan 	<ul style="list-style-type: none"> ▪ Sii Ardayda Laylisyo ku saabsan weynaynta ama yareynta shaxannada.

Ujeedooyinka a gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris- barashada iyo Qalabyada loo baahan yahay	Tallaabooyi nka Qiimeynta
<ul style="list-style-type: none"> ▪ Sawiridda shaxan ka yar shaxankii dhabta ahaa ee la siiyey iyaga oo adeegsanaya Isirka yareynta. 		<p>islbedelayn, isla markaana Qeexaya Gudboon (isku began) ee shaxanka Taas darterd saamiyadu waa kuwo Isle'eg oo sababaya saamigalnimada dhererrada dhinacyada Gudboon ee shaxankaas.</p>	
<ul style="list-style-type: none"> ▪ Sharxidda xaqiiqooyinka ku saabsan Isu-ekaanshaha laba saddexagal ▪ Adeegsiga (Dabbakhaadda) Qeexidda isu-ekaanshaha laba saddexagal. 	<p>4.2. Isu-ekaanshaha saddexagallada (17 Xiso) 4.2.1. Barashada saddexagal lada Isu-eg.</p>	<ul style="list-style-type: none"> ▪ Ku bilow casharkan Naqtiimidda Afkaaraha muhiimka ahaa ee casharkii hore eek u saabsanaa Isirrada Weynaynta ama yareynta shaxannada iyo saamigalnimada Dhinacyada isku began (dhinacyada Gudboon) ee shaxannada isu-eg (khaas ahaan saddexagallada). ▪ Ku hoggaami Ardayda in ay Falanqeeyaan Isu-ekaan shaha laba saddexagal, isla markaana ku xiisageli ardayda in ay Isu-ekaan shaha laba saddexagal u Qeexaan sedan soo socota "Saddexagalka ABC wuxuu u egyahay saddexagalka DEF , Haddii Dhinacyada Gudboon ee labada saddexagal ay saamigal isu yihiin , Isla markaana xaglaha Gudboon ay isku sargo'an yihiin" Taas oo sumad ahaan noqonaysa Haddii $\Delta ABC \sim \Delta DEF$, 	<ul style="list-style-type: none"> ▪ Weydii ardayda, oo Fursad u sii in ay Tiraab ahaan (oraah ahaan) kaga Jawaabaan , waa maxay macnaha Isirka weynaynta , Isirka yareynta, Dhinacyada saamigalka ah ee shaxannada isu-eg (khaas ahaan saddexagallada). ▪ Weydii Ardayda in ay Qeexidda ku dabbakhaan (u adeegsadaan) Furfurista

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>Markaa</p> $\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD} = k \text{ iyo}$ $m(\hat{A}) \equiv m(\hat{D}), m(\hat{C}) \equiv m(\hat{F})$ $m(\hat{B}) \equiv m(\hat{E}),$ <p>Iyada oo la siinayo Faahfaahin dheer oo ku saabsan isku beegnaanta dhinacyada iyo xaglaha Labadaas saddexagal iyo Adeegsiga Sumadda Isuekaanshaha oo ah “~”.</p> <ul style="list-style-type: none"> ▪ Ku dhiirigeli Ardayda in ay Qeexiddaas ku dabbakhaan Furfurista mas’alooyinka sida:- Waxaa lagu siiyey in $\Delta BQR \sim \Delta MNT$, haddii $BQ = 2sm$, $QR = 5sm$, $MN = 4sm$ markaa Raadi Dhererka dhinaca NT? Furfuris :- $\frac{BQ}{MN} = \frac{QR}{NT}$ $\frac{2sm}{4sm} = \frac{5sm}{NT}$ $NT = 10sm$ 	<p>mas’alooyin ka la xidhiidha Isuekaanshaha laba saddexagal oo lasiiyey (In ay sheegaan in labada saddexagal ay isuegyihiin iyo in kale).</p> <ul style="list-style-type: none"> ▪ Hubi sida ay Ardaydu u adeegsanayaan summaddaha Isuekaanshaha oo ah “~” iyo Isku sargonaanta oo ah “≡”
<ul style="list-style-type: none"> ▪ Soo saaridda Isuekaanshaha laba saddexagal oo kasta iyaga oo adeegsanaya Tijaabooyinka Isuekaanshaha saddexagall 	<p>4.2.2. Tijaabooyinka Isuekaanshaha Saddexagallada.</p>	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay xaqiiqsadaan in aanay lagama maarmaan ahayn Isbarbardhigidda Dhammaan Dhinacyada iyo xagalaha isku began ee labada saddexagal marka la hubinayo in ay labadaas saddexagal Isuegyihiin iyo in kale, isla markaana ay ku Filan tahay in la isbarbardhigo Qaybo ka mid ah 	<ul style="list-style-type: none"> ▪ Sii Ardayda Mas’alooyin ka ku saabsan Tijaabooyinka lagu xaqiiiyo Isuekaanshaha saddexagallada kana hubi Jawaabahoo

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>ada ee kala ah “Dh,dh,dh”; “Dh,x,dh” iyo “x.x”.</p>		<p>Dhinacyada iyo xaglaha isku began ee labadaas saddexagal. Tusaale ahaan saamigalka saddexda dhinac ee isku began (Dh.dh.dh), Saamigalka laba dhinac oo isku began iyo isku sargo’naanta xagasha u dhexaysa labadaas dhinac (Dh.x.dh) iyo Isku sargo’naanta laba xaglood oo isku began (x.x).</p> <ul style="list-style-type: none"> ▪ Adiga oo Tusaale ahaan u qaadnaya Fursad u sii Ardayda in ay sababeeyaan mid ka mid Tijaabooyinkaas, ka soo qaad “Dh.dh.dh”. <ol style="list-style-type: none"> 1. Waxaa la gu siiyey saddexagal iyo Dhererrada saddexdiisa dhinacba. 2. Waxaa kale oo lagu siiyey Madoorsoomaha saamigalnimada “k”. <ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay sawiraan Saddexagal u-eg saddexagal ka la siiyey iyaga oo ka Duulaya Qiimaha “k” (Ha noqdo mid ka ballaadhan-ka weyn ama mid ka yar) kadibna Fursad u sii in ay Hubiyaan in xaglaha isku began ee labadaas, saddexagal ay yihiin xaglo isku sargo’an iyaga oo ku cabbiraya xagal-Beeg. ▪ Ku dhiirigeli Ardayda in ay soo gabagabeeyaan 	<p>da.</p>

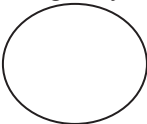
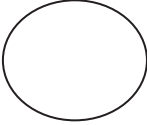
Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>Isu-ekaanshaha laba saddexagal iyaga oo ka duulaya Qeexiddaas.</p> <ul style="list-style-type: none"> ▪ Labada Tijaabo ee hadhsan waxa aad kor ku Qoran (ka hor inta aanay Adeegsan Tijaabooyinka,, Fursad u sii Ardayda in ay wax kasta ku hubiyaan iyaga oo cabbiraya Qaybaha isku began ee saddexagallada). 	
<ul style="list-style-type: none"> ▪ Sharxidda xidhiidhka ay leeyihiin labada wareeg ee labada saddexagal ee Isu-eg. ▪ Sharxidda xidhiidhka ay Leeyihiin bededka labada saddexagal ee Isu-eg. 	<p>4.2.3. Wareegga iyo Bedka saddexagallada Isu-eg.</p>	<ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay Naqtiin ku sameeyaan Jidka lagu hela wareegga saddexagallada iyo Jidka lagu helo Bedka saddexagallada. ▪ Fursad u sii Ardayda in ay soo saaraan labada wareeg iyo labada Bed ee laba saddexagal oo isu-eg. Ka dibna ka caawi in ay Raadiyaan saamiga labada wareeg ee labadaas saddexagal iyo saamiga labada Bed ee labadaas saddexagal. ▪ Ka caawi Ardayda in ay Taas u soo gabagabeeyaan sedan soo socota “Saamiga Labada wareeg ee labadaas saddexagal ee Isu-eg wuxuu le’eg yahay saamiga Dhinacyadooda isku began”. Sidaas oo kale “Saamiga labada Bed ee labadaas saddexagal ee Isu-eg wuxuu le’eg yahay labajibbaarka saamiga Dhinacyadooda Isku began”. 	<ul style="list-style-type: none"> ▪ Sii Ardayda layliso ku saabsan Raadinta wareegga iyo bedka laba saddexagal oo Isu-eg.

CUTUBKA 5^{aad} : GOOBOOYINKA (20 Xisadood)**Ujeeddooyinka Guud ee Cutubkan:**

Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Si Fiican u sii kordhiyaan Fahamkooda ku saabsa Goobooyinka.
- Xaqiiqsashada xidhiidhka ka dhexeeya Xarriiqaha Toosan iyo Goobooyinka.
- Adeegsiga (Dabbakhidda) Xaqiiqooyinka Aasaasiga ah eek u saabsan xagal-xudduneedka iyo xagal-Geeska Goobada iyo Xagalaha ay sameeyaan Boqonno isgoynaya isla markaana ay xisaabiyaan (soo saaraan) Cabbirradooda.

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>Ardaydu waa in ay Awood u yeelan kartaa:-</p> <ul style="list-style-type: none"> ▪ Soosocidda Qaansada weyn iyo Qaansada yare e Goobada. ▪ Soo soocidda Fikraddaha “Sektorka” iyo “Sejmentiga” Goobada. ▪ Shaxidda Fikraddaha “Taabtaha” iyo “Tikraarka” Goobada. ▪ Muujinta xuddunta Goobada iyaga oo adeegsanaya Habka dhisidda. 	<p>5. GOOBOOYINKA</p> <p>5.1. Sii Kordhinta Barashada Goobooyinka (8 Xiso)</p> <ul style="list-style-type: none"> ▪ Qaybaha Goobada. ▪ Dhisidda xuddunta Goobada. 	<ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay Naqtiin ku sameeyaan Goobo, Gacanka, Dhexroorka, Boqonka iyo Wareegga (weegaarka) Goobada. ▪ Fursad u sii Ardayda in ay kala soocaan Qaansada weyn iyo Qaansada yare e Goobada iyaga oo adeegsanaya Tusaaleyaal kala duwan. ▪ Ka caawi Ardayda in ay soo bandhigaan sektarka iyo sejmentiga Goobada. ▪ Ku Hoggaami Ardayda in ay muujiyaan xidhiidhka suuragalka ah ee ka dhexayn kara Goobada iyo xaariiqda Toosan. Taas oo ah xarriiqda Toosan iyo Goobada xidhiidhkoodu wuxuu noqon karaa: ▪ Fursad u soo Ardayda in ay Dhuuxaan (sifiican u bartaan) Fikraddaha ama macnaha xarriiqaha ah “Taabtaha” iyo Tikraarka. Goobada. ▪ Ku hoggaami Ardayda in ay helaan (soo saaraan) 	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay Magacaabaan Qaansada weyn, Qaansada yar, xarriiqda Taabtaha iyo xarriiqda Tikraarka ee Goobo la siiyey oo si cad u muujin aysa Qaybahaas. ▪ Sii Ardayda Mas’alooyin ku saabsan Raadinta xuddunta Goobada iyaga oo adeegsanaya Habka dhisidda Fudud.

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>xuddunta Goobada, iyaga oo adeegsanaya Dhisidda Tallaabooyinka Fudud ee soo socda.</p> <p>→ Sawir Goobo, Adiga oo adeegsanaya shilin am akumi.</p>  <p>→ Sawir Boqonka AB ee Gobadaas</p>  <p>A————— B</p> <p>→ Dhis Qotomaha kala badha Boqonka AB .</p> <p>→ SAWir Boqon kale, kuna magacow CD.</p> <p>→ Dhis Qotomaha kala Badha Boqonka CD.</p> <p>▪ → Qotomaha kala badha AB iyo Qotomaha kala badha CD Barta ay iska gooyaan ku magacow “0”. Barta “0” waa xuddunta Goobadaas ee la Raadinayey.</p>	
<ul style="list-style-type: none"> ▪ Qeexidda (Soo soocidda) xagal – xuddunneedka iyo Xagal-Geeska Goobada. ▪ Xisaabinta (soo saaridda) Cabbirka xagal xuddunneedka 	<p>5.2. Xagalaha Goobada. (12 Xiso)</p> <p>5.2.1. Xagal-xuddunneedka iyo xagal-Geeska Goobada.</p>	<ul style="list-style-type: none"> ▪ Ka caw ardayda in ay dhuuxaan macnaha “Xagal-Xuddunneed” iyo xidhiidhka ay la leedahay Qaansada Afsaarka u ah. Kadibna ku hoggaami Ardayda in ay Furfuraan Mas’alooyinka la xidhiidha. ▪ Ka caawi Ardayda in ay Dhuuxaan macnaha “Xagal-Gees”, kadibna ku dhiirigeli Ardayda in ay cabbiraan xagal-xuddunneedka iyo 	<ul style="list-style-type: none"> ▪ Sii Ardayda Laylisyo ku saabsan xisaabinta Cabbirrada xagal-xuddunneedka, xagal-Geeska iyo Qaansada Afsaarka u ah ee la siiyey.

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>ama Qaansada Afsaarka u ah iyaga oo ka duulaya Macluumaadka la siiyey.</p>		<p>xagal-Geeska Afsaarkoodu yahay Qaanso isku mid ah Isla markaana ay ku soo gabagabeeyaan in :-</p> <ol style="list-style-type: none"> 1. Cabbirka xagal-Geeska Goobadu waa badhka ($\frac{1}{2}$) cabbirka xagal-xudduneedka Goobadaas. 2. Cabbirka xagal-Geeska Goobadu waa Badhka (Nuska) cabbirka Qaansada Afsaarka u ah. <p>$m(\sphericalangle ABC) = \frac{1}{2} m(\sphericalangle AOC)$ $m(\sphericalangle ABC) = \frac{1}{2} m(\sphericalangle ADC)$</p> <ul style="list-style-type: none"> ▪ Fursad u sii ardayda in ay xidhiidhiyaan xaglo-Geesyada Goobada ee Afsaarkoodu yahay Qaanso isku mid ah (Hal Qaanso). Tusaale ahaan <p>$m(\sphericalangle ABE) = m(\sphericalangle ACE) = m(\sphericalangle ADE) = \frac{1}{2} m(\sphericalangle AXE)$</p>	
<ul style="list-style-type: none"> ▪ Caddaynta cabbirka xagasha ay sameeyeen Laba Boqon oo isyoynaya ee Goobada dhexdeeda wuxuu le'eg yahay Nuska wadarta cabbirka labada Qaanso ee labadaas Boqon. ▪ Furfurista mas'alooyin ka la xidhiidha 	<p>5.2.2. Xaglaha ka sameysan laba Boqon oo Isgoynaya.</p>	<p>Waxa lagu siiyey Goobadan kor ka muuqata, Haddaba ku hoggaami Ardayda in ay soo bandhigaan Tallaabooyinkan soo socda:-</p> <ol style="list-style-type: none"> 1. Isku xidh Barta "D" iyo Barta "C", Adiga oo adeegsanaya Mastarad. 2. Cabbir xagasha ACD iyo xagasha BDC iyaga oo adeegsanaya xagal-Beeg. 3. Iyaga oo ka duulaya Tallaabada 2aad weydii in ay Qoraan cabbirka Qaansada AD iyo cabbirka Qaanshada BC. 4. Cabbir xagasha BEC. 5. Xidhiidhi $m(\sphericalangle BEC)$ iyo wadarta $m(\sphericalangle AD)$ iyo 	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay Dabbakhaan Qaacidada lagu siiyey Dhammaadka casharkan, Isla markaana Fursad u sii in ay hubiyaan Jawaabahooda iyaga oo adeegsanaya cabbirida.

Ujeedooyinka a gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris- barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
xagasha ay sameeyaan laba Boqon oo Isgoynaya Goobada dhexdeeda.		m(BC). Taas oo noqonaysa $m(\sphericalangle BEC) = \frac{1}{2} [m(AD) + m(BC)]$	
<ul style="list-style-type: none"> ▪ Qeexidda Afargeesleyaasha Meersan. ▪ Sharraxidda Astaanta Afargeeslaha meersa. ▪ Caddaynta ARagtiinka ku saabsan xaglaha Gudaha ee Iska soo horjeeda ee Afargeeslaha meersan. ▪ Soo saaridda (xisaabinta) cabbirka xagasha aan la aqoon ee Afargeeslaha meersan. 	5.2.3. Afargeesle yaasha Meersan.	<ul style="list-style-type: none"> ▪ Fursad u sii in ay dhuuxaan Qeexidda afargeeslaha meersan, kadibna ku hoggaami in ay cabbiraan xaglaha iska soo Horjeeda ee Afargeeslaha meersan, isla markaana ay ku soo Gabagabeeyaan in xaglahaasi ay yihiin xaglo-isdhammaystira. ▪ Ka caawi Ardayda in ay caddeeyaan in xaglaha iska soo horjeeda ee Afarammaystira iyaga oo adeegsanaya Aqoontii ay ka heleen xagal –Geeska. ▪ Ku hoggaami Ardayda in ay Raadiyaan cabbiraadda xagalha Qarsoon (Aan la aqoon) ee Afargeeslaha meersan. 	<ul style="list-style-type: none"> ▪ Sii Ardayda Laylisyo ku saabsan Afargeesleyaasha meersan iyo Fikraddaha la xidhiidhaba.

CUTUBKA 6^{ad} : BARASHADA ITIMAALKA (15 Xisadood)**Ujeeddooyinka Guud ee Cutubkan:**

Cutubkani marka uu dhammaado kadib, Ardaydu waxay Awood u yeelan doonaan (Awood u yeelan karaan)

- Fahamka Fikraddaha Maxsuullada dhabta ah, kuwa aan la xaqiijin Karin (la saadaalinkarin) iyo kuwa aan suurtaga lkaba ahayn.
- Qgaanshaha xaqiiqooyinka khaaska u ah waqdhacda, Tirada maxsuullada iyo Itimaalka waqdhacaha Fudud.

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>Ardaydu waa in ay Awood u yeelan kartaa:-</p> <ul style="list-style-type: none"> ▪ Kala soo cidda Maxsuulada (Natiijada) Dhabta ah (suurtagalka la) iyo kuwa aan suurtagalka ahayn. 	<p>6. BOARASHADA ITIMAALKA</p> <p>6.1. Fikradda Itimaal (5 Xiso)</p> <ul style="list-style-type: none"> ▪ Maxsuulka dhabta ah . 	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay kala soocaan Maxsuulada dhabta ah (certain outcomes) iyo kuwa aan suurtagalka ahayn (Impossible out comes), Iyaga oo keenaya (ku siinaya) Tusaaleyaal Nololsha dhabta ah oo kala duwan sida kuwan soosocda:- <ul style="list-style-type: none"> → Isniinta maalinta ka dambaysa waa Talaado. → Laba xarriiqood oo isgoynaya waxay Iska gooyaan saddex Barood. →Marka Biyaha la karkar iyo waxay isu bedelaan caano. → Qorraxdu waxay ka soo baxdaa Bari. ▪ Ku hoggaami arday in ay maxsuulka dhabta u qaataan “1”, maxsuulka aan suurtagalka ahayna u qaataan “0”. 	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay ku siiyaan ama keenaan Tusaaleyaal ka duwan oo ay maskaxdooda ka keeneen.
<ul style="list-style-type: none"> ▪ Soo soocidda Tijaabinta, waqdhacda iyo Tirada waqdhacda. ▪ Soo 	<p>6.2. Itimaalka waqdhacaha fudud (10 Xiso)</p>	<ul style="list-style-type: none"> ▪ Ka Taageer Ardayda in ay si Fiican u Fahmaan Macnaha “Itimaalka” iyaga oo sharrax ka bixinaya waxyaabaha aan la xaqiijin kar in Maxusuulkooda. Adiga oo 	<ul style="list-style-type: none"> ▪ Weydii Ardayda Su’aalo ku saabsan Maxsuulada aan la xaqiijin Karin ee Tijaabinta. ▪ Sii Ardayda

Ujeedooyi nka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>saaridda Itmaalka waqdhacaha Fudud.</p> <ul style="list-style-type: none"> ▪ Tibaaxidda Itimaalka oo ay u Tibaaxayaan (u bedelayaan) Jajabyo, JajabTobanle iyo boqolley (Boqolkiiba) 		<p>ku bilaabaya Tusaaleyaal sida:-</p> <p>→ Haddii aan shilin kor u Tuurno wuxuu u dhicikaraa Madax ama xarash.</p> <p>→ Roob ayaa dilidoona Barrito</p> <p>→ Haddii aan kor u Tuurno Laf-Laadhuu waxay u dhici kartaa mid ka mid ah lixda weji (1 ilaa 6) ee lafaadhuuga.</p> <ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay xaqiiqsadaan in waxyaabaha aan la xaqiijin Karin Maxsuulkooda (waxa ay noqon doonaan) Tiro ahaan iyada oo la Adeegsanayo xisaabta Itmaalka. ▪ Fursad u sii Ardayda in ay Qeexaan Ereyada kala ah “Tijaabin”; waqdhac; Tirada Maxsuulka (Tirada waqdhacaha) kadibna ka caawi Ardayda in ay kala soocaan ereryadaas iyo macnahooda iyaga oo adeegsanaya Tusaaleyaal kala duwan Tusaale ahaan Haddii aan kor u Tuurno Hal Laf-laadhuu, lix maxsuul ayaa suurtagal ah, kuwaas oo kala ah 1,2,3, 4, 5, 6, waxaana la yiraahda Tirada Guud Maxsuulada, Tuuridda lafaadhuugana. Waxaa la yiraahdaa Tijaabin sidaas oo kale mid kasta oo ka mid ah Tirooyinkaas lixda ah waxaa la yiraahdaa waqdhac. 	<p>Laylisy ku saabsan Raadinta Itimaalka waqdhacaha Fudud.</p>

Ujeedooyinka gaarkah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Barisharashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>▪ Ku hoggaami Ardayda in ay soo dhiraandhiriyaan Qaacidada (Jidka lagu helo) waqdhacda Itimaalka, iyaga oo adeegsanay Tusaaleyaal kala duwan. Itimaalka waqdhacdu =</p> <p><u>Tiradalagadoorbida max suulka</u> <i>TiradaGuudeeMaxsuulada</i></p> <p>▪ Ka caawi Ardayda in ay soo saaraan Itimaalka waqdhacaha Fudud, isla markaana ay u Tibaaxaan (u Qoraan) Jajab-Tobanle iyo Boqolley (Boqolkiiba) Tusaale :- Kasoo qaad xarfaha uu ka kooban yahay Ereyga “FASAL” ayaa lagu Qoray kaadhah, kadibna lagu riday Baakad yar-Haddaba waa maxay Itimaalka aad Baakadda yar kaga soo saari karto xarfka “A”?</p> <p>→ Tirada xarfaha uu ka kooban yahay Ereyga “FASAL” waa Tirada Guudee maxsuulada waana 5 maxsuulka aad doorbidday waa xarfka “A” markaa Tirada Xarfaha aad doonayso waa 2 - Itimaalka aad ku soo saari karto xarfka A =</p> <p><u>Tiradalagadoorbida max suulka</u> <i>TiradaGuudeeMaxsuulada</i></p> <p>$= \frac{2}{5} = 0.4 = 40\%$</p>	

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyin ka Qiimeynta
		$\frac{AC}{AB} = \frac{AD}{AC} \Rightarrow \frac{b}{c} = \frac{b_1}{b}$ $\Rightarrow b^2 = b_1c$ <ul style="list-style-type: none"> ▪ Adiga oo Taas ka duulaya ayaa waxa aad Qeexi kartaa Aragtiinka yukliidh iyo waydaarkiisa. ▪ Ku dhiirigeli Ardayda in ay Kashaqeeyaan Laylisyo badan iyaga oo ku dabbakhaya Aragtiinka yukliidh iyo waydaarkiisa sida Tusaalahan soo socda. <p>Tusaale :$\triangle ABC$ waa saddexagal Qumman oo shakaalkiisu yahay \overline{AB}, Jooggiisuna yahay \overline{CD} oo ku Qotoma \overline{AB}. Haddii $AD = 4\text{sm}$, $DB = 5\text{sm}$, markaa Raadi dhererrada \overline{AC} iyo \overline{BC}</p> <ul style="list-style-type: none"> ▪ Sidaas oo kale waxa aad siin kartaa Tusaaleyaal si ay u muujiyaan waydaarka Aragtiinkaas yukliidh 	
<ul style="list-style-type: none"> ▪ Dabbakhaadda (Adeegsiga) Aragtiinka Baytogarasi iyo waydaarkiisa si ay 	<p>7.1.2. Aragtiinka Baytogarasi iyo waydaarkiisa.</p>	<ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay Naqtiin ku sameeyaan Aragtiinka yukliidh. ▪ Ka caawi Ardayda in 	<ul style="list-style-type: none"> ▪ Weydii Ardayda su'aalo ku saabsan Dabbakhidda

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyin ka Qiimeynta
<p>ugu Furfuraan Mas'alooyinka la xidhiidha.</p>		<p>ay xidhiidhka yukliidh u adeegsadaan soo dhiraandhirinta xidhiidhka Baytogaras, ka dibna ay Qeexaan Aragtiinka Baytogaras.</p> <ul style="list-style-type: none"> ▪ Ku dhiirigeli Ardayda in ay “Aragtiinka Baytogaras” ku dabbakhaan Furfurista (xallinta) Adduunka ee dhabta ah. ▪ Fursad u sii Ardayda in ay falanqeyaan Weydaarka Aragtiinka Baytogaras, kadibna ka caawi Ardayda in ay kaas ku dabbakhaan Furfurista weedh-xisaabeedyada Nolosha dhabta ah iyaga oo la siinayo dhawr tusaale iyo Laylisyo kala duwan. 	<p>Aragtiinka Baytogaras iyo weydaarkiisaba.</p>
<ul style="list-style-type: none"> ▪ Sharxidda saamiyada Tirignoomateriga ee kala ah Sayn (sine), koosayn (Cosine) iyo Taajanti (Tangent) iyaga oo adeegsanaya saddexagal Qumman. 	<p>7.2. Barashada Bilowga ah ee Tirignoomateriga (12 Xiso)</p> <p>7.2.1. Saamiyada Tirignoomateriga .</p>	<ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay Magacaabaan shakaalka, Horjeedaha iyo Deriska xagasha Fiiqan ee la siiyey ee saddexagal Qumman. ▪ Waxa aad Tusaale u qaadani kartaa Saddexagalkan Qumman ee ABC 	<ul style="list-style-type: none"> ▪ Sii Ardayda Laylisyo ku saabsan Mas'alooyin la xidhiidha Faahfaahinta Saamiyada Tirignoomateriga (Saynka, koosaynka iyo Taanjentiga) ee xagalaha saddexagal

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>Magacow</p> <p>I. Shakaalka ΔABC</p> <p>II. Horjeeddaha ΔABC (Dhinaca ka soo horjeeda xagasha Fiiqan ee la suntay – B)</p> <p>III. Deriska ΔABC (Dhinaca la deriska ah xagasha Fiiqan ee la suntay).</p> <ul style="list-style-type: none"> ▪ Ku hoggaami Ardayda in ay Qeexaan ama sharrax ka bixiyaan saddex ka mid ah saamiyada Tirignooma teriga (Sine, Cosine iyo Tagent) iyaga oo adeegsanaya saddexagalka Qumman Sida ΔABC ee kor ka muuqda una muujinaya sedan soo socota:- <p>Sin</p> $\hat{B} = \frac{\text{DhererkaHo rjeeddaha}\hat{B}}{\text{DhererkaShakaalka}}$ <p>Cos</p> $\hat{B} = \frac{\text{DhererkaDeriska}\hat{B}}{\text{DhererkaShakaalka}}$ <p>Tan</p> $\hat{B} = \frac{\text{DhererkaHo rjeeddaha}\hat{B}}{\text{DhererkaDeriska}\hat{B}}$ <ul style="list-style-type: none"> ▪ Fursad u sii Ardayda in ay macno ahaan si Fiican u dhuuxaan mid kasta oo ka mid ah saamiyaddaas, 	<p>Qumman oo la siiyey dhererka dhinacyadiisa laba ama ka badan (uogolow in ay adeegsadaan aragtiinka baytogarasi ay u Raadiyaan dhererka dhinaca maqan).</p> <ul style="list-style-type: none"> ▪ Hubishaqad ooda

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		iyaga oo ka Ambaqaadaya Tusaaleyaal dhawir sida:- Tusaale : Soo saar saynka (sine), koosaynka, (cosine) iyo Taanjentiga (Tangent) xaglaha cabbirkood u yihiin x^0 iyo y^0 ee lagu siiyey.	
<ul style="list-style-type: none"> ▪ Soo saaridda Qiimaha saamiyada Tirignoomateriga ee xaglaha cabbirkoodu yihiin 30^0, 45^0 iyo 60^0. 	7.2.2. Qiimaha saynka, koosaynka iyo Taanjentiga ee Xaglaha Cabbirkoodu yahay 30^0 , 45^0 iyo 60^0 .	<ul style="list-style-type: none"> ▪ Ka caawi Ardayda in ay soo saaraan Qiimaha $\sin 60^0$, $\cos 60^0$, $\tan 60^0$, $\sin 30^0$, $\cos 30^0$, iyo $\tan 30^0$ iyaga oo adeegsanaya saddexagal siman oo dhererka dhinacyadka caawinaya sedan soo socota:- $\triangle ABC$ waa saddexagal siman b) Sawir Qotomaha \overline{CD} oo ku Qotoma dhinaca \overline{AB}. t) Soo qaado $\triangle ACD$, kadibna Adeegso xidhiidhka Baytgoriyaan si aad u 	<ul style="list-style-type: none"> ▪ Weydii Ardayda in ay Raadiyaan saamiyada Tirignoomateriga (Sine, Cosine iyo Tangent) ee xaglaha 30^0, 45^0 iyo 60^0 iyaga oo Adeegsanaya Dhawr saddexagal. ▪ Hubi shaqada Arday kasta.

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>raadiso dhererka \overline{CD} sida</p> $(AC)^2 = (AD)^2 + (CD)^2 \Rightarrow$ $(2)^2 = (1)^2 + (CD)^2$ $CD = \sqrt{3}$ <p>J) Adeegso Jidka lagu helo Qiimaha Saamiyada Tirignoomateriga (Sine, Cosine and Tagant) si aad u Raadiso Qiimaha ku began ee Xagalahaas. Tusaale ahaan</p> $\sin 30^\circ = \frac{\text{Dhererka Horjeeddaha}}{\text{Dhererka Shakaalka}}$ $\sin 30^\circ = \frac{AD}{AC} = \frac{1}{2}$ $\cos 30^\circ = \frac{\text{Dhererka Deriska}}{\text{Dhererka Shakaalka}}$ $\cos 30^\circ = \frac{CD}{AC}$	

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<ul style="list-style-type: none"> Dabbakhidda saamiyada Tirigoomateriga ee xaglaha 30° iyo 60° si ay u Furfuraan Mas'alooyinka la xidhiidha. 		$\cos 30^\circ = \frac{\sqrt{3}}{2}$ $\tan 30^\circ = \frac{1}{\sqrt{3}}$ $\tan 30^\circ = \frac{AD}{CD}$ $\tan 30^\circ = \frac{1}{\sqrt{3}}$ <ul style="list-style-type: none"> Sidaas oo kale soosaar Qiimaha sin 60°, Cos 60° iyo Tan 60°, Adiga oo adeegsanaya Habkaas kore. <p>Ka caawi ardayda in ay soosaaraan Qiimaha Sin 45°, Cos 45°, iyo Tan 45° iyaga oo adeegsanaya saddexagal Qumman oo labaale ah oo dhererka Addimadiisu (Horjeedaha iyo deriska) yihiin $\sqrt{2}$. Halbeeg (Xusuusin:- Dhererka Shakaalku waa .</p>	$\frac{\text{Dhererka Horjeedaha}}{\text{Dhererka Deriska}}$

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyin ka Qiimeynta
		<p>Habeeg. $\sin 45 = \frac{1}{\sqrt{2}}$</p> <ul style="list-style-type: none"> ▪ Hooseeyaha Ha ka dhigin Tiro Lakab leh). ▪ U horsed ardayda in ay ka shaqeeyaan Tusaaleyaal dhawr ah oo ku saabsan Furfurista Mas'alooyinka Adduunka ee dhabta ah, iyaga oo Dabbakhaya saamiyada Tirignoomateriga ee xaglaha cabbirkoodu yahay 30° iyo 60°. Sida Tusaalahan soo socda:- ▪ Sida ka muuqata Jaantuskan kore Barta "A" waxay u Jirtaa sagxadda Dhismaha Dugsiga Fogaan dhan 15m, Cabbirka xagasha 	<ul style="list-style-type: none"> ▪ Sii Ardayda mas'alooyin ku saabsan Dabbakhaadda saamiyada Tirignooma teriga ee xagalaha 30°, 60° iyo 45° kuwaas oo ka Tarjumaya Nolosha dhabta ah.

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>ay sameeyaan Barta "A" iyo Fiiqa u korreeya Dhismaha Dugsiga (oo ah Barta C) waa 60°. Haddaba Raadi Joogga Dhismaha Dugsigaas.</p> <p>Furfuris:- U Fiiro $\triangle ABC$, waa saddexaga Qumman. Waxaynu Adeegsan karnaa saamiga Tirignoomateriga ee ah Tan 60°.</p> $\tan 60^\circ = \frac{BC}{AB}$ $\tan 60^\circ = \frac{b}{15}$ $b = 15 \times \tan 60^\circ$ $b = 15 \times \sqrt{3}$ $b = 15\sqrt{3} \text{ m}$ <p>\therefore Joogga Dhismaha Dugsigu waa $15\sqrt{3} \text{ m}$.</p> <p>▪</p>	
▪ Soo soocidda Qaybaha	7.3. Shaxannada Adkaha ah	▪ Ku xiisageli Ardayda in ay sheegaan	▪ Weyii Ardayda in ay

Ujeedooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
<p>Bayraamidhka</p> <ul style="list-style-type: none"> ▪ Soo soocidda moodheelada Bayraamidhka ▪ Magacaabista Noocyada kala duwan ee Bayraamidhyada iyada oo laga Furinayo Salalkooda. 	<p>(6 Xiso)</p> <p>7.3.1. Bayraamidh</p>	<p>walxaha kala duwan ee qaabkoodu yahay Bayraamidh iyaga oo muujinaya moodheellada Bayraamidhka.</p> <ul style="list-style-type: none"> ▪ Fursad u sii ardayda in ay soo soocaan Geeska, Cidhifka, salka iyo wejiyada Bay raamidhka, iyaga oo Adeegsanaya moodheel. ▪ Ku dhiirigeli Ardayda in ay Bayraamidka u Qeexaan sedan soo socota “Bayraamidhku waa shaxan Adke ah oo ka sameysan sal iyo Bar aan ku dul dhicin salka oo la yiraahdo Fiiq (Aex). Bayraamidhka waxaa lagu magaca salkiisa). Bayaraamidh 	<p>soo soocaan</p> <p>Qaybaha Bayraamidhka iyo toobin Goobeedka.</p>

Ujeeddooyinka gaarka ah ee casharka	Ciwaanada Cutubka qaybaha iyo Casharada	Wax-qabadyada Baris-barashada iyo Qalabyada loo baahan yahay	Tallaabooyinka Qiimeynta
		<p>Labajibbaaran kani waa Bayraamidhka BCDE.</p> <ul style="list-style-type: none"> ▪ Ku hoggaami Ardayda in ay si Fiican u dhuuxaan Noocyada Bayraamidhyada sida Bayraamidh saddex-Geesle ah (saddexagal ah), Bayraamidh shan-Geesle ah. Isla markaana ay ku soo Gabagbeeyaan. <p>Marka salku yahay Goobo Bayraamidhku wuxuu noqonayaa Toobin.</p>	