

JAMHUURIYADDA DIMOQRAADIGA SOOMAALIYA
WASAARADDA WAXBARASHADDA IYO BARBAARINTA

XISAAB

FASALKA AFRAAD

$$10100_2 = 20_{10}$$

$$DH.3 = \{3, 6, 9, \dots\}$$

XAFIISKA MANAAHIJTA

F.A.

JAMHUURIYADDA DIMOQRAADIGA SOOMAALIYA

**WASAARADDA WAXBARASHADA IYO BARBAARINTA
XAFIISKA MANAAHIJTA**

XISAAB

FASALKA AFRAAD

4

aan Wasaaradda Waxbarashada iyo Barbaarinta laga helin oggolaansho.
Buuggan lama daabacan karo lamana guurin karo iyadoo

DAABACAADII SADDEXAAD

Waxa lagu daabacay Madbacadda Qaranka
Xamar — 1976

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H O R D H A C

Buggan waxa loogu talagalay ardayda fasalka afraad ee Dugsiyada Baraymariga ah.

Ardayda buuggan loogu talagalay muddo ayay haatan af Soomaali wax ku soo baranayeen. Sidaa darteed, waxaannu ku rajo weynnahay in aanay wax dhibaato ah kala kulmayn afka uu ku qoranyahay.

Xafiiska manaahjtu wuxuu mahad u celinayaa Muuse Cabdi Cilmi, Bashiir Faarax Kaahiye, Maxamed Cilmi Bullaale iyo Xasan Daahir Obsiye oo buuggan qoray.. Waxa, ayana, mahad gaar ah leh, dhammaan, dadkii suurageliyey soo saarida buuggan oo ay ka mid yihiin Idriis Maxamuud Cabdulaahi, Muxsin Taabit, iyo Cali Axmed Xuseen oo sawirrada u sameeyay.

Waxa kale oo mahad leh Wakaaladda Madbacadda Qaranka oo suurtagelisay in uu buuggani dhaqso u soo baxo.

Bashiir Faarax Kaahiye
Maamulaha Xafiiska Manaahjta

CUTUB I

N A Q T I I N

Tirooyin Dhaban ah iyo tirooyin Kisi ah.

Ururka tirooyinka idili waxa weeye { 0, 1, 2, 3, 4, 5, }

Hormo ururka { 0, 2, 4, 6, 8, 10, 12, } bal u fiirso.

Waxaad baadhaa xidhiidh ku tirasanayaasha hormo ururka ka dhexeeya ama wax ay wadaagaan.

Waa mide, ku jire waliba waa tiro idil. Ta labaad, ku jire waliba hadhaa la'aan buu 2 ugu qaybsamaa.

Qeex :

Tiro hadday hadhaa la'aan 2 u qaybsami ' arto waxa loo yaqaan «tiro dhaban ah».

Tusaale :

32 tiro dhaban ah ma tahay?

Furfurid :

32 hadday hadhaa la'aan 2 u qaybsami karto, waa tiro dhaban ah. Bal hadda aan eegno inay 32 u qaybsam karto 2.

$$\begin{array}{r}
 16 \\
 2 \overline{) 32} \\
 \underline{2} \\
 12 \\
 \underline{12} \\
 00
 \end{array}$$

Marka 32 la qaybshaha yahay, 2 qaybshaha, qaybtu waa 16, hadhaaguna waa eber. Markaa 32 waa tiro dhaban ah.

Layli :

Tirooyinka soo socda mid waliba ma tahay tiro dhaban ah.

132, 54, 170, 78, 1396:

Ogsoonow in tirooyinka ku dhammaada 0, 2, 4, 6, 8 ay yihiin tirooyin dhaban ah. Marka, haddaba, aad aragto inay tiro ku dhamaatay 0, 2, 4, 6, 8 midkood, judhaba waa aad garan karaysaa inay tiradaasi tahay tiro dhaban ah.

Ururka tirooyinka idil marka laga saaro hormo ururka tirooyinka dhabanka ah waxa soo hadha hormo urur kale oo ah { 1, 3, 5, 7, 9, 11, 13, 15, }.

Hore waxan u nidhi tiro hadday hadhaa la'aan u qaybsami karto 2 waa tiro dhaban ah. Haddaad eegto hormo ururka { 1, 3, 5, 7, 9, 11, } ku jire walba oo hormo ururkaasi leeyahay hadhaa la'aan 2 ma u qaybsami karaa? Si kale haddaan u dhigno, tirooyinkaasi ma yihiin tirooyin dhaban ah? Ku jire walba haddaad eegto, marka loo qaybsho 2 hadhaa baa soo hadha.

Metelan, 19 haddaan u qaybino laba, waxan helnaa qayb ah 9 iyo hadhaa ah 1. Markaas ma aha tiro dhaban ah. Ku jirayaasha ururka { 1, 3, 5, 7, 9, } midkaad eegtaaba hadhaa buu leeyahay, marka 2 loo qaybsho. Markaa, ku jirayaasha ururkaasi ma aha tirooyin dhaban ah.

Qeex :

Hadhaa la'aan tirada aan u qaybsami karin 2 waxa loo yaqaan «tiro kisi ah».

Tusaale :

33 ma tahay tiro kisi ah?

Furfurid :

33, marka laba loo qaybsho hadday hadhaa yeelato, waa

tiro kisi ah. Bal hadda 33 aan u qaybino 2.

$$\begin{array}{r} 16 \\ 2 \overline{) 33} \\ \underline{2} \\ 13 \\ \underline{12} \\ 1 \end{array}$$

Marka 33 loo qaybsho 2 waxa la helaa hadhaa ah 1. Markaa, 33 waa tiro kisi ah.

Ogsoonow in tirooyinka ku dhammaada 1, 3, 5, 7, 9 ay yihiin tirooyin kisi ah. Marka, haddaba, aad aragto inay tiro ku dhammaatay 1, 3, 5, 7, 9, midkood, judhaba waxaad garan karaysaa inay tiradaasi tahay tiro kisi ah.

Layli :

1. Eeg tirooyinkan oo sheeg kuwa kisi ah. 7, 51, 78, 80, 15, 63, 326, 569.
2. Eeg tirooyinkan oo sheeg kuwa dhaban ah. 6, 24, 43, 17, 30, 62, 128.
3. Qor tirooyinka dhabanka ah marka laga bilaabo 10 ee 30 lagu joojiyo.
4. Qor tirooyinka kisiga ah marka laga bilaabo 21 la-guna joojiyo 41.
5. Raadi wadarta tirooyinka kisiga ah ee ka yar 10 oo dhan.
6. Qor inta tiro dhaban ah ee u dhaxaysa 21 iyo 47.
7. Qor inta tiro kisi ah ee u dhaxaysa 16 iyo 39.

TIROOYINKA MUTUXAN

Ururka tirsiiimo waa ururka tirooyinka idil oo laga reebo e-ber. Markaa ururka tirsiiimo waxa weeye { 1, 2, 3, 4, 5, 6, 7, ... }

Tirooyinka dhabanka ah ee ku jira ururkaasi waxa weeye hormo ururka { 2, 4, 6, 8, 10, ... }.

Tirooyinka kisiga ah ee ururka ku jiraana waxa weeye hormo ururka { 1, 3, 5, 7, 9, 11, 13, ... }. Ururka tirsiiimo waxan ka soc saari karnaa hormo urur kale oo ah

$$\{ 2, 3, 5, 7, 11, 13, 17, 19, ... \}$$

Hormo ururkaa, haddaan ku jire walba eegno isirradiisa, waxan ogaanaynaa in isirradiisu yihiin hal iyo isaga.

Qeex :

Haddii tiro isirradeedu ay yihiin hal iyo iyada oo qudhaa, tiradaa waxa la yidhaa tiro mutuxan.

Tusaha soo socdaa wuxuu muujinayaa shanta tiro ee mutuxan ee ugu horreeya iyo tiro mutuxan walba isirradeeda.

| Tiro mutuxan | isirro |
|--------------|--------|
| 2 | 1 × 2 |
| 3 | 1 × 3 |
| 5 | 1 × 5 |
| 7 | 1 × 7 |
| 11 | 1 × 11 |

2 oo ah tirada mutuxan ee ugu horraysa, isirradeedu

waxa weeye 1 iyo 2; 3 isirradeedu waa 1 iyo 3; 5 isirradeedu waa 1 iyo 5.

Tusaale :

29 ma tahay tiro mutuxan?

Furfurid :

Isirrada 29 waxa weeye 1 iyo 29, mana jiraan isirra kale oo ay leedahay tirada 29. Markaa 29 waa tiro mutuxan

Tusaale :

21 ma tahay tiro mutuxan?

Furfurid :

Isirrada 21 waxa weeye 1, 3, 7, 21. Markaa, kol haddii ay jiraan isirro kale oo aan ahayn 1 iyo 21 oo ay leedahay tirada 21, tiradaasi ma aha tiro mutuxan.

Tiro alla tiradii idil ee ka weyn 1 waa tiro mutuxan ama ma aha tiro mutuxan.

Qeex :

Tiro hadday tiro idil tahay, ay ka weyn tahay 1 oo aanay tiro mutuxan ahayn, waxa la yidhaa tiro farcan

Tirooyinka farcan shanta ugu horreeyaa waxa weeye 4, 6, 8, 9, 10. Shantaa tiro bal hadda mid walba aan isirradeeda eegno.

Tuse

Tiro Farcan

Isirro

| | |
|----|------------|
| 4 | 1×4, 2×2 |
| 6 | 1×6, 2×3 |
| 8 | 1×8, 2×4 |
| 9 | 1×9, 3×3 |
| 10 | 1×10, 2×5. |

Tusaale :

Waa maxay isirrada tirada farcan ee 12?

Furfurid :

$$12 = 1 \times 12$$

$$12 = 2 \times 6$$

$$12 = 3 \times 4$$

Markaa, isirrada 12 waxa weeye 1, 2, 3, 4, 6, 12.

Xusuusnow 1 inana tiro mutuxan iyo tiro farcan mid-kocdna ahayn.

Layli :

1. Tirooyinka soo socda raadi mid walba isirradeeda.
2. 6, 5, 17, 18, 36, 47, 53, 26, 144;
b) tirooyinka kor ku qoran teebaa dhaban ah? Teebaase kisi ah?
t) tirooyinka kor ku qoran teebaa tiro mutuxan ah Teebaase tiro farcan ah?
2. Ururka tirsiiimo sagaalka tiro ee ugu horreeya raadi wadartooda. Wadartaa aad heshay :
b) Ma kisi baa mise waa dhaban?
t) Ma tiro mutuxan baa mise waa tiro farcan?
3. 3 iyo 5 haddaad isku dhufato, tarantu ma tiro mutuxan baa mise waa tiro farcan.
4. Soddon iyo lixda tiro ee ugu horreeya ururka tirsiiimo raadi mid walba isirradeeda.

ISIRRO MUTUXAN

Tirada mutuxani waxay leedahay laba isir oo aan isle'ekayn oo midkocd yahay 1. Isirka kale waa inuu noqdaa tiradaa qudheeda. Laakin tiro hadday farcan tahay waxay leedahay, 1 iyo iyada qudheeda ka sakow, isir kale. Metelan: isirrada 12 waxa weeye 1, 2, 3, 4, 6, 12. Isirrada 12 waxa ku jira qaar tiro mutuxan ah, kuwaas oo ah 2 iyo 3. Markaa 2 iyo 3 isirrey u yihiin 12, isla markaana waa tirooyir mutuxan.

Qeex :

Isir mutuxani waxa weeye isir ah tiro mutuxan.

Dib aan ugu noqono tirada 12 iyo isiradeeda mutuxan. Waxan naqaannaa inay 12 tahay tiro farcan, oo isiradeeduna yihiin 1, 2, 3, 4, 6, 12. 12 ma u dhigantaa taranta isiradeeda mutuxan?

Isirrada mutuxan ee 12 waxa weey 2, 2 iyo 3. Taranta $2 \times 2 \times 3$ waxay tahay 12.

Hadda, tusaale ahaan aan u qaadanno 18 oo ah tiro farcan. Isirrada 18 waxa weeye 1, 2, 3, 6, 9, 18. Markaa isirrada mutuxan 18 waxa weeye 2, 3, iyo 3. 18 waxay u dhigantaa $2 \times 3 \times 3$.

Tusaale :

36 u dhig sansaanta taranta isiradeeda mutuxan.

Furfurid :

Ururka isirrada 36 waxa weeye :

$$\{ 1, 2, 3, 4, 6, 9, 12, 18, 36 \}$$

Markaa isirrada mutuxan ee 36 waxay yihiin 2, 2, 3 iyo 3,

Sidaa awgced 36 waxay u dhigantaa $2 \times 2 \times 3 \times 3$.

Tusaale :

U dhig 30 taranta isirreeada mutuxan.

Ururka isirrada 30 waxa u yahay :

$$\{ 1, 2, 3, 5, 6, 10, 15, 30 \}$$

Markaa isirrada mutuxan ee 30 waxa weeye 2, 3 iyo 5.

Haddaba 30 waxay u dhigantaa $2 \times 3 \times 5$.

Layli :

Tirooyinka soo socda mid walba u dhig sansaanta taranta isiradeeda mutuxan :

| | | | | | | | |
|------|-----|------|-----|-----|-----|-----|----|
| (b) | 24 | (t) | 25 | (j) | 28 | (x) | 60 |
| (kh) | 48 | (d) | 105 | (r) | 126 | (s) | 98 |
| (sh) | 252 | (dh) | 70. | | | | |

Markaa, waxa inoo muuqda tiro kasta oo farcan in loo dhigi karo taranta isiradeeda mutuxan.

Haddii tiro farcan aynu dooneyno in aan u dhigno sansaanta taranta isiradeeda mutuxan, hilinkii aynu soo sheegnay waan isticmaali karnaa. Hilinkan soo socdana waan isticmaali karaynaa.

Tusaale :

U dhig 12 sansaanta taranta isiradeeda mutuxan :

| | |
|---|----|
| 2 | 12 |
| 2 | 6 |
| 3 | 3 |
| | 1 |

Sida kor ku muujisan, 12 marka ugu horreeya u qaybi tirada mutuxan ee u yar oo 2 ah. Qaybta aad hesho hadday 2 u qaybsamayso haddana u qaybi. Marka qayb aad hesho ay u qaybsami weydo 2, waxaad ku daydaa tirada mutuxan ee labaad oo 3 ah. Sidii oo kale haddana u wad. Imika, tirooyinka **xarriijinta** xagga bidix ka xiga, haddaad hocs u soo

raacdo, waxaad arkaysaa in 2, 2 iyo 3 ay yihiin isirrada mutuxan ee 12. Markaa, isku dhulo isirrada mutuxan: $2 \times 2 \times 3 = 12$.

Tusaale :

U dhig 70 taranta isirradeeda mutuxan.

$$\begin{array}{r|l} 2 & 70 \\ 5 & 35 \\ 7 & 7 \\ & 1 \\ \hline 70 & = 2 \times 5 \times 7. \end{array}$$

Layli :

Layligii hore kaga shaqee hilinkan dambe.

Isir weynaha ay wadaagaan iyo dhufsane u yaraha ay wadaagaan

Inta aynaan bilaabin isir weynaha ay wadaagaan iyo dhufsane u yaraha ay wadaagaan, bal hadda dheeho tusaalaha soo socda.

Haddaan eegno ururka $\{5, 7, 9, 10, 14, 143\}$ iyo ururka $\{1, 2, 3, 5, 6, 7\}$, waxa inoo muuqanaya in labada urur ay kala duwan yihiin. Hase yeeshee, waxa jira ku tirsanaaal labada ururba ku jira, oo ay labada urur wadaagaan. Labadan urur ku tirsanayaasha ay wadaagaani waxa weeye iyo 7.

Markaa ururka $\{5, 7\}$ hormo urur buu u noqonayaa labadii ururba. Midda kale waxan odhan karnaa ururka $\{5, 7\}$ dhextaal buu u yahay $\{5, 7, 9, 10, 14\}$ iyo $\{1, 2, 3, 5, 6, 7\}$.

Qeex :

Dhextaalka laba urur waxa weeye ururka ay ku jiraan ku tirsanayaasha ay labada urur wadaagaan.

Layli :

Labadii urur ee walba raadi dhextaalkooda.

1. $\{5, 9, 13, 15, 26\}, \{2, 7, 8, 100, 15\}$.
2. $\{3, 6, 12, 24, 32, 19\}, \{18, 24, 7, 19, 6\}$.
3. $\{28, 25, 17, 13\}, \{2, 5\}$.
4. $\{1, 2, 3\}, \{1, 2, 3, 4, \dots\dots\}$.
5. Ururka tirooyinka idil iyo ururka tirsiiimo.

Isirrada ay laba tiro wadaagaan.

Sidii aynu hore u nidhi isirrada tiro ay leedahay waxa weeye tirooyinka hadhaa la'aan ay tiradaasi u qaybsami karto.

Isirrada 12 waxa weeyaan ururka $\{1, 2, 3, 4, 6, 12\}$. Ku jireyaasha ururkaasi mid walba hadhaa la'aan buu u qaybin karaa 12. Isirrada 18 waxa weeye $\{1, 2, 3, 6, 9, 18\}$.

Labada urur ee $\{1, 2, 3, 4, 6, 12\}$ iyo $\{1, 2, 3, 6, 9, 18\}$ ka hore waa isirrada 12, ka dambana waa isirrada 18. Labada urur waxa dhextaal u ah ururka $\{1, 2, 3, 6\}$. Ururka $\{1, 2, 3, 6\}$ wuxuu ka kooban yahay isirrada 12 iyo 18 ay wadaagaan.

Tusaale :

Raadi isirrada ay 24 iyo 30 wadaagaan.

Furfurid :

Ururka isirrada 24 waxa weeye :

$$\{1, 2, 3, 4, 6, 8, 12, 24\};$$

Ururka isirrada 30 waxa weeye :

$$\{1, 2, 3, 5, 6, 10, 15, 30\}.$$

Markaa isirrada ay 24 iyo 30 wadaagaani waxa weeye : $\{1, 2, 3, 6\}$.

Tusaale :

Raadi isirrada ay wadaagaan 36 iyo 18.

Furfurid :

Isirrada 36 waxa weeye :

$$\{1, 2, 3, 4, 6, 9, 12, 18, 36\}$$

Isirrada 18 waxa weeye :

$$\{1, 2, 3, 6, 9, 18\}.$$

Markaa isirrada ay 36 iyo 18 wadaagaani waxa weeye : $\{1, 2, 3, 6, 9, 18\}$.

Layli :

Raadi isirrada labadii tiro ee isgarab yaallaaba ay wadaagaan.

- | | | |
|----------------|---------------|--------------|
| (1) 12, 24; | (2) 35, 105; | (3) 144, 96; |
| (4) 90, 135; | (5) 165, 390; | (6) 48, 54, |
| (7) 72, 36; | (8) 350, 42; | (9) 625, 25; |
| (10) 210, 945. | | |

Isir weynaha ay wadaagaan.

Haddaan dooneyno inaan helno isir weynaha ay wadaagaan 12 iyo 18, waa inaan horta helnaa isirrada ay wadaagaan 12 iyo 18. Hore waxaan u helnay inay isirrada ay wadaagaan 12 iyo 18 ay yihiin ku jirayaasha ururka $\{1, 2, 3, 6\}$. Isirradaa ay wadaagaan 12 iyo 18 ka u weyni wuxuu yahay 6.

Markaa, isir weynaha ay wadaagaan 12 iyo 18 waxa weeye 6.

Qeex :

Isirrada ay wadaagaan laba ama dhawr tiro, ka u weyn waxa loo yaqaan isir weynaha ay tirooyinkaasi wadaagaan.

Markaa la soo gaabinayana waxa lo qoraa : **I. W. W**

Tusaale :

Raadi I.W.W. 120 iyo 24.

Furfurid :

Isirrada 120 waa :

$$\{ 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, 120 \}.$$

$$\text{Isirrada 24 waa : } \{ 1, 2, 3, 4, 6, 8, 12, 24 \}.$$

Isirrada ay wadaagaan 120 iyo 24 waa :

$$\{ 1, 2, 3, 4, 6, 8, 12, 24 \}.$$

Markaa I. W. W. 120 iyo 24 waa: 24.

Layli :

Raadi I. W. W. lammaanayaashan tirooyinka ahi :

- (1) 12, 24; (2) 35, 105; (3) 144, 360;
(4) 90, 135; (5) 165, 390; (6) 48, 144;
(7) 72, 36; (8) 350, 42; (9) 625, 25;
(10) 210, 945; (11) 17, 43.

Hilin kale oo lagu raadsho I. W. W.

Haddaan rabno inaan 12 u dhigno taranta isirradeeda mutuxan hilinkan baan raaci karnaa, sidii aynu horeba u soo aragnay :

$$\begin{array}{r|l} 2 & 12 \\ 2 & 6 \\ 3 & 3 \\ & 1 \end{array}$$

$$\text{Markaa } 12 = 2 \times 2 \times 3.$$

18 haddaan dooneyno inaan u dhigno taranta isirradeeda mutuxan sidan baan yeeli karnaa :

$$\begin{array}{r|l} 2 & 18 \\ 3 & 9 \\ & 3 \\ & 1 \end{array}$$

$$\text{Markaa } 18 = 2 \times 3 \times 3.$$

Markaa, isirrada mutuxan ee ay tarantooda labadaa tiro ka kooban yihiin, ee ay wadaagaani, waa 2×3 . 2×3 waxa weeye I. W. W. 18 iyo 12.

I. W. W. waxan si hawl yar ugu heli karnaa, inagoo isirrada mutuxan ee labada tiro isla mar keliya doonna, sidan oo kale :

$$\begin{array}{r|ll} 2 & 12 & 18 \\ 3 & 6 & 9 \\ & 2 & 3 \end{array}$$

Marka hore, labada tiraba u qaybi isirka mutuxan ee u yar ay wadaagaan, haddana u qaybi isirka mutuxan ee u yar ee labada tiraba u qaybsamaan.

Sidaas ku wad ilaa aad weydo isir mutuxan oo labada tiraba qaybinaya. Markaas, isirrada mutuxan ee ay wadaagaan labada tiro tarantooda ayaa ah I. W. W. labada tiro. Imika I. W. W. 12 iyo 18 waa 2×3 oo ah 6.

Tusaale :

Raadi I. W. W. 126 iyo 189.

| | | |
|---|-----|-----|
| 3 | 126 | 189 |
| 3 | 42 | 63 |
| 7 | 14 | 21 |
| | 2 | 3 |

Markaa, I. W. W. 126 iyo 189 waa: $3 \times 3 \times 7 = 63$.

Layli :

Raadi I.W.W. lammaanayaashan tirooyinka ahi :

- (1) 12, 24; (2) 35, 105; (3) 144, 96;
- (4) 90, 135; (5) 165, 390; (6) 48, 54;
- (7) 72, 36; (8) 350, 42; (9) 625, 25;
- (10) 210, 945; (11) 84, 78; (12) 630, 70;
- (13) 130, 78; (14) 323, 442; (15) 143, 37.

Dhufsanayaasha tiro.

Haddii aan isku dhufanno laba tiro, taran baan helnaa. Labada tiro ee aan isku dhufannay mid waliba isir bay u tahay taranta. Dhinac kale haddaan ka eegno waxan odhan karnaa **tarantu labada isir mid walba dhufsane ayay u tahay.** Metelan haddaan isku dhufanno 2 iyo 3 waxan helnaa 6. Markaa 6 waa dhufsane 2, isla markaana 6 waa dhufsane 3. Tusaale kale haddaan qaadanno, oo aan isku dhufanno 1 iyo 6, tarantaan helnaa waa 6. Markaa 6 dhufsane ayay u tahay 1 iyo 6ba. Dhufsanayaasha ay tiro leedahay, sida aan loo koobi karin ururka tirsiimo, ayaan loo koobi karin.

Dhufsanayaasha ay tiro leedahay waxay ka koobmaan tiradaas oo lagu dhuftay 1, tiradaas oo lagu dhuftay 2, tiradaas oo lagu dhuftay 3, tiradaas oo lagu dhuftay 4, tiradaas oo lagu dhuftay kun Markaa, waxan odhan karnaa dhufsanayaasha ay tiro leedahay waxay ka kooban yihiin tira-

daas oo ku jirayaashaa ururka tirsiimo kolba mid lagu dhuf-to. Metelan dhufsanayaasha 1 waa ururka tirsiimo; dhufsa-

nayaasha 2 waxa weeye $\{ 2, 4, 6, 8, 10, \dots \}$ oo ah ururka tirooyinka dhabanka ah; dhufsanayaasha 3 waxa weeye $\{ 3, 6, 12, 15, 18, \dots \}$.

Tusaale :

Raadi dhufsanayaasha 12.

Dhufsanaha u horreeya ee 12 waa 12, ka labaad waa 24, ka saddexaad waa 36, Markaa dhufsanayaasha 12 waa ururka $\{ 12, 24, 36, 48, 60, 72, 84, 96, 108, \dots \}$.

Layli :

Tirooyinka soo socda mid walba qor dhufsanayaasheeda ilaa ka 18aad.

- 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.

Ogsoonow : in tiro kastiba isirradeeda u tahay dhufsane.

Dhufsanayaasha ay laba tiro wadaagaan.

Waxan nidhi tirada 3 dhufsanayaasheedu waa ururka

$$\{ 3, 6, 9, 12, \dots \}.$$

2na dhufsanayaasheedu waa $\{ 2, 4, 6, 8, \dots \}$. Labada urur ee

$\{ 2, 4, 6, 8, \dots \}$ iyo $\{ 3, 6, 9, 12, 15, \dots \}$ dhextaal wa-

xa u ah ururka $\{ 6, 12, 18, 24, 30, \dots \}$. Ururkaa dhex-
taalka u ah labada urur, ee midna yahay ururka dhufsanayaasha 2, ka kalana yahay ururka dhufsanayaasha 3, waxa la yidhaa ururka dhufsanayaasha ay wadaagaan 2 iyo 3.

Tusaale :

Raadi dhufsanayaasha ay wadaagaan 6 iyo 9.

Furfurid :

Dhufsanayaasha 6 waa :

$$\{ 6, 12, 18, 24, 30, 36, 42, 48, 54, \dots \}$$

Dhufsanayaasha 9 waa :

$$\{ 9, 18, 27, 36, 45, 54, 63, \dots \}$$

Markaa, dhufsanayaasha ay wadaagaan 6 iyo 9 waa :

$$\{ 18, 36, 54, 72, \dots \}$$

Tusaale kale :

Waa maxay dhufsanayaasha ay wadaagaan 12 iyo 36?

Furfurid :

Dhufsanayaasha 12 waa :

$$\{ 12, 24, 36, 48, 60, 72, \dots \}$$

Dhufsanayaasha 36 waa :

$$\{ 36, 72, 108, 144, \dots \}$$

Markaa, dhufsanayaasha ay wadaagaan 12 iyo 36 waa :

$$\{ 36, 72, 108, 144, \dots \}$$

Layli :

Raadi dhufsanayaasha ay wadaagaan lammaane kasta oo hoos ku qorani.

- | | | |
|--------------|--------------|---------------|
| (1) 2, 3; | (2) 5, 6; | (3) 9, 15; |
| (4) 8, 7; | (5) 8, 12; | (6) 15, 20; |
| (7) 14, 6; | (8) 17, 12; | (9) 27, 18; |
| (10) 54, 72; | (11) 13, 39; | (12) 35, 15 |
| (13) 4, 9; | (14) 5, 4; | (15) 144, 36. |

Dhufsane u yaraha ay wadaagaan.

Tusaale hore inoo soo maray waxan ka ogaannay in 6 dhufsanayaasheedu ay yihiin, $\{ 6, 12, 18, 24, \dots \}$, 9 dhufsanayaasheedu ay yihiin $\{ 9, 18, 27, 36, 45, \dots \}$, iyo inay dhufsanayaasha ay wadaagaan 6 iyo 9 yihiin $\{ 18, 36, 54, 72, \dots \}$.

Ururkaa dhufsanayaasha ay wadaagaan 6 iyo 9, haddaan dheehanno, waxa ugu yar 18. Taas macnaheedu wuxu yahay, dhufsanaha u yar ee ay wadaagaan 6 iyo 9 waa 18.

Qeex :

Dhufsanayaasha ay wadaagaan laba ama dhawr tiro, ka u yar waxa loo yaqaannaa dhufsane u yaraha ay wadaagan tirooyinkaasi.

Marka la soo gaabinayana waxa loo qoraa Dh. Y. W.

Tusaale :

Raadi dhufsane u yaraha ay wadaagaan 4 iyo 5.

Furfurid :

Dhufsanayaasha 4 waa :

$$\{ 4, 8, 12, 16, 20, 24, 28, 32, \dots \}$$

Dhufsanayaasha 5 waa :

$$\{ 5, 10, 15, 20, 25, 30, 35, 40, \dots \}$$

dhufsanayaasha ay wadaagaan 4 iyo 5 waa ururka :

$$\{ 20, 40, 60, 80, \dots \}$$

Markaa Dh. Y. W. 4 iyo 5 waa 20.

Tusaale kale :

Waa maxay Dh. Y. W. 5 iyo 6?

Furfurid :

Dhufsanayaasha 5 waa :

$$\{ 5, 10, 15, 20, 25, 30, 35, \dots \}$$

Dhufsanayaasha 6 waa :

$$\{ 6, 12, 18, 24, 30, 36, \dots \}$$

Dhufsanayaasha ay wadaagaan 5 iyo 6 waa :

$$\{ 30, 60, 90, \dots \}$$

Markaa Dh. Y. W. 5 iyo 6 waa 30.

Layli :

Lammaane kasta oo tirooyin ahba raadi Dh. Y. W.

- | | | |
|--------------|--------------|---------------|
| (1) 2, 3; | (2) 5, 6; | (3) 9, 15; |
| (4) 8, 7; | (5) 8, 12; | (6) 15, 20; |
| (7) 14, 6; | (8) 17, 12; | (9) 27, 18; |
| (10) 54, 72; | (11) 13, 39; | (12) 35, 15; |
| (13) 4, 9; | (14) 5, 4; | (15) 144, 36. |

Hilin kale oo lagu raadsho Dh. Y. W.

Layligan sare haddaan u fiirsanno waxan arkaynaa laba tiro hadday labaduba tirooyin mutuxan yihiin, ama midkood tahay tiro mutuxan, in Dh.Y.W. labadaa tiro uu yahay tarantooda. Metelan Dh.Y.W. 2 iyo 3 waa 6, Dh.Y.W. 5 iyo 6 waa 30; Dh.Y.W. 17 iyo 12 waa 204.

Hore waxan u naqaanay sida loo soo saaro I.W.W. laba tiro. Metelan, I.W.W. 12 iyo 18 waxa weeye 6. 12 iyo 18 labaduba waa tirooyin farcan. Haddaba sidii tirooyinka mutuxan Dh.Y.W. 12 iyo 18 ma yahay tarantooda? Bal aan eegno.

Dhufsanayaasha 18 waxa weeye :

$$\{ 18, 36, 54, 72, \dots \};$$

dhufsanayaasha 12na waa $\{ 12, 24, 36, 48, 60, 72, \dots \};$

dhufsanayaasha ay wadaagaan 12 iyo 18 waa :

$$\{ 36, 72, 108, 144, \dots \}.$$

Markaa Dh.Y.W. 12 iyo 18 waa 36.

Weydiiskii ahaa Dh.Y.W. 12 iyo 18 ma yahay taranta 12 iyo 18 celiskiisu waa maya, maxaa yeelay taranta 12 iyo 18 waa 216, Dh.Y.W. 12 iyo 18na waa 36. Laakiin waxa dhab ah taranta 18 iyo 12 marka loo qaybsho I.W.W. 12 iyo 18 inaan heleyno Dh.Y.W. 12 iyo 18.

$$\frac{\text{Taranta 12 iyo 18}}{\text{I.W.W. 12 iyo 18}} = \frac{12 \times 18}{6} = 36 = \text{Dh.Y.W. 12 iyo 18}$$

Tusaale :

Raadi Dh.Y.W. 12 iyo 15 adigoo isticmaalaya taranta iyo I.W.W. 12 iyo 15.

$$\frac{\text{Taranta 12 iyo 15}}{\text{I.W.W. 12 iyo 15}} = \frac{12 \times 15}{3} = 60 = \text{Dh.Y.W. 12 iyo 15.}$$

Markaa Dh.Y.W. 12 iyo 15 waa 60. Jawaabtaa ku hubi hilinkii ururrada.

Layli :

Masalooyinkii layligii hore furfur adigoo isticmaalaya hilinkan taranta iyo I.W.W.

Hilin saddexaad oo lagu raadin karo Dh.Y.W.

Hilinkii labaad ee lagu raadinayey Dh.Y.W. laba tiro wuxuu ahaa in labada tiro tarantooda loo qaybsho I.W.W. labada tiro.

Dh.Y.W. 12 iyo 18 waxan u helnay sidan :

$$\text{Dh.Y.W. 12 iyo 18} = \frac{12 \times 18}{6} = \frac{(2 \times 2 \times 3) \times (2 \times 3 \times 3)}{6} = 36$$

Midda kale :

$$\text{Dh.Y.W. 12 iyo 15} = \frac{12 \times 15}{3} = \frac{(2 \times 2 \times 3) \times (3 \times 5)}{3} = 60.$$

Tii hore oo ahayd Dh.Y.W. 12 iyo 18 markaan raadi-neyney, taranta 18 iyo 12 baan u qaybinay 6 oo ah I.W.W. 12 iyo 18. Markaan isku jarjarnay, waxa inoo soo hadhay $2 \times 2 \times 3 \times 3 = 36$ oo ah Dh.Y.W. 12 iyo 18. Bal aan raadino isirrada mutuxan ee 12 iyo 18.

$$12 = 2 \times 2 \times 3$$

$$18 = 2 \times 3 \times 3.$$

2 labaad baa isirro u ah 12; 2 saddexaadna waa u isirro 18, 2na mar keliya ayay isir u tahay 18; 3na mar keliya ayay isir u tahay 12. Dh.Y.W. 12 iyo 18na haddaan eegno waa $36 = 2 \times 2 \times 3 \times 3$. Markaa 2 labaad baa isirro u ah 36; 2 saddexaadna isirray u yihiin 36. Markaa Dh.Y.W. 12 iyo 18 waxan ku helnay innagoo isku dhufannay isirrada mutuxan ee 18 iyo 12, inagoo isirka mutuxan ee 2 qaadanay labadii jeer uu isirka mutuxan u ahaa 12, 3na qaadanay labadii jeer ee uu isirka mutuxan u ahaa 18. Markaa aan soo gaabino intaa aan soo sheegnay. Dh.Y.W. 12 iyo 18 waxan u heleynaa sidan:

| | | | |
|---|----|----|---|
| 2 | 12 | 18 | (1) u qaybi isirka mutuxan ee u yar oo ah 2 |
| 2 | 6 | 9 | (2) labada tiro tii u qaybsamaysa u qaybi 2 |
| 3 | 3 | 9 | (3) u qaybi tii u qaybsamaysa isirka mutuxan ee labaad |
| 3 | 1 | 3 | (4) u qaybi tii u qaybsamaysa isirka mutuxan ee labaad. |
| | 1 | 1 | |

Isku dhifo $2 \times 2 \times 3 \times 3 = 36$.

Markaa, dhufsana u yaraha ay wadaagaan 12 iyo 18 waa 36. Ta labaad, sideen u heleynaa Dh.Y.W. 12 iyo 15? Hilinkan dambe innagoo raacayna sidan baan yeeleynaa.

| | | | |
|---|----|----|---|
| 2 | 12 | 15 | (1) labada tiro tii u qaybsamaysa u qaybi isirka mutuxan ee u yar oo ah 2 |
| 2 | 6 | 15 | (2) labada tiro tii u qaybsamaysa u qaybi isirka mutuxan ee u yar oo ah 2 |
| 3 | 3 | 15 | (3) labada tiro tii u qaybsamaysa u qaybi isirka mutuxan ee sadde-xaad. |
| | 1 | 1 | |
| | 1 | 1 | |

Markaa, Dh.Y.W. 12 iyo 15 waa $2 \times 2 \times 3 \times 5 = 60$ oo ah intii aan hilinnadii horena ku soo helnay.

Tusaale :

Raadi Dh.Y.W. 20 iyo 18.

Furfurid :

| | | |
|---|----|----|
| 2 | 20 | 18 |
| 2 | 10 | 9 |
| 3 | 5 | 9 |
| 3 | 5 | 3 |
| 5 | 5 | 1 |
| | 1 | 1 |

Markaa, Dh.Y.W. 20 iyo 18 waa $2 \times 2 \times 3 \times 3 \times 5 = 180$.

Ku hubi jawaabtan hilinnadii hore aad u taqaanay.

Layli :

Raadi Dh.Y.W. labadii tiro ee isgarab yaallaaba :

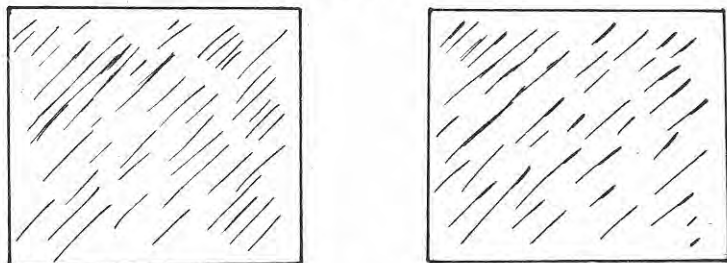
- (1) 2, 3; (2) 5, 6; (3) 9, 15;
 (4) 8, 7; (5) 8, 12; (6) 15, 20;
 (7) 14, 6; (8) 17, 12; (9) 27, 28;
 (10) 54, 72; (11) 13, 39; (12) 35, 15;
 (13) 4, 9; (14) 5, 4; (15) 144; 36.

**XISAABFALLADA IYO JAJABYADA :
ISUGEYN**

Kol haddii jajabyadu ay yihiin tirooyin, waa inaan ku suubbin karnaa xisaabfallada aan ku suubbino tirooyinka idil; waa inaan jajabyada isugeyn karnaa, kala goyn karnaa, isku dhufan karnaa, oo aan isuqaybin karnaa. Markaa waxa ugu horreeya ee aan ka fikirnaa wuxuu yahay sida la isugu geeyo jajabyada. Waad taqaan macnaha isugeynta tirooyinka idil. Haddii aan rabno inaan fahamno isugeynta jajabyada, waa inaan ku dhisnaa aqoonta aan u leenahay isugeynta tirooyinka idil. Haddii labada laydi ee hoos ku taswiiran mid walba aan u qaybinno hal

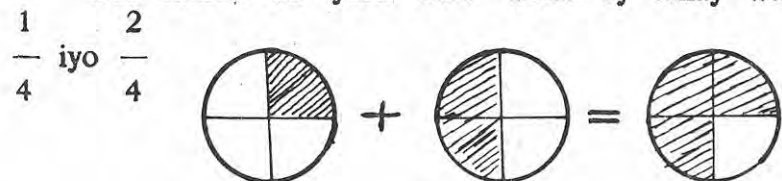
gobol, wadarta labada jajab, $\frac{1}{1}$ iyo $\frac{1}{1}$, waxay la mid tahay

wadarta tirooyinka idil ee 1 iyo 1.



Markaa, waxad aragtaa in $\frac{1}{1} + \frac{1}{1} = \frac{2}{1}$
oo la mid ah $1 + 1 = 2$

Bal hadda ka yara fikir waxa ay tahay wadarta



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

Midda kale, $\frac{1}{3} + \frac{1}{3}$ haddaan sida kore oo kale u sawirno waxan heleynaa

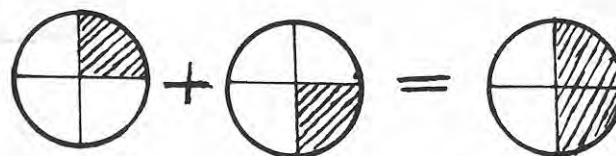


Markaa, $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

Tusaale :

Isugee $\frac{1}{4}$ iyo $\frac{1}{4}$

Furfurid :

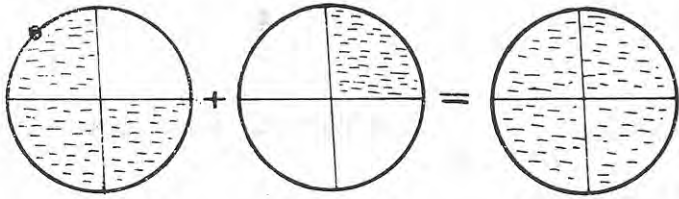


Markaa, $\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$

Tusaale kale :

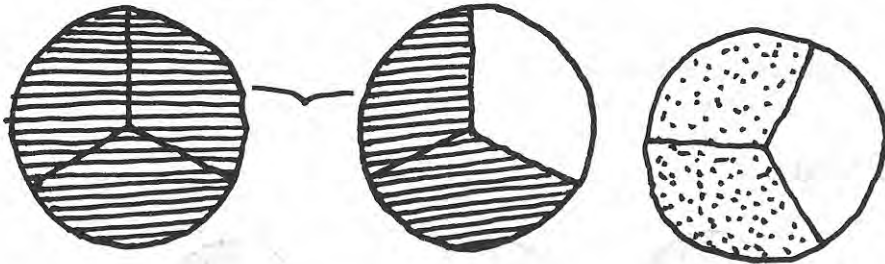
Isugee $\frac{3}{4}$ iyo $\frac{1}{4}$

Furfurid :



Markaa, $\frac{3}{4} + \frac{1}{4} = \frac{4}{4} = 1$

Waa laga yaabaa inu kuu muuqdo hilin fudud oo la isticmaali karo marka la isugeynayo laba jajab oo hooseeyeyaa-shocdu ay isku mid yihiin. Bal aan raadinno wadarta $\frac{5}{3}$ iyo $\frac{2}{3}$ innagoo jaantusyo ka faa'iideysaneyna.



$\frac{5}{3}$

$\frac{2}{3}$

Haddaan tirinno inta saddexeed ee ay isku noqdaan $\frac{2}{3}$ iyo $\frac{5}{3}$ waa 7 saddexeed. Markaa waxa dhab ah in $\frac{2}{3} + \frac{5}{3} = \frac{7}{3}$

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

Layli :

Jajabyadan isugee adoo isticmaalaya jaantusyo.

(1) $\frac{2}{3} + \frac{7}{3}$ (2) $1\frac{1}{5} + \frac{13}{5}$ (3) $\frac{9}{4} + \frac{2}{4}$

(4) $\frac{1}{10} + \frac{9}{10}$ (5) $\frac{3}{7} + \frac{2}{7}$ (6) $\frac{5}{6} + \frac{1}{6}$

(7) $2\frac{7}{3} + 3\frac{1}{3}$ (8) $4\frac{1}{6} + 2\frac{3}{6}$ (9) $3\frac{1}{4} + \frac{5}{4}$

(10) $\frac{13}{5} + \frac{8}{5}$

(Markaa aad masalooyinka layligan furfurto, waxaad arki kartaa haddii la isugeeyo laba jajab oo hooseeyeyaashoodu isku mid yihiin inay wadartoodu tahay jajab hooseeyihiisu la mid yahay hooseeyeyaashii labada jajab ee la isugeeyey, sarree-yihiisuna la mid yahay wadarta sarreeyeyaasha labada jajab ee la isugeeyey).

Metelan, haddii aad rabto inaad isugeeyso $\frac{13}{5}$ iyo $\frac{8}{5}$,

labada sarreeye intaad isugeeyso, ayaad hoos dhigi hooseeyaha labada jajab, markaa :

$\frac{13}{5} + \frac{8}{5} = \frac{13+8}{5} = \frac{21}{5}$

Haddaba haddii b, t, iyo j ay yihiin tirooyin idil, oo $t \neq 0$, waxa dhab ah in

$$\frac{b}{t} + \frac{j}{t} = \frac{b+j}{t}$$

Jajabyada hooseeyyaashoodu kala duwan yihiin :

Way fududayd isugeynta jajabyada hooseeyyaashoodu isku midka yihiin. Laakin marka aan damacno inaan isugeynno laba jajab oo hooseeyyaashoodu kala duwan yihiin ayaa woxoogey dhibaata ah lala kulmaa. Metelan, haddaan doonno

inaan isugeynno $\frac{1}{2}$ iyo $\frac{3}{4}$, waxaan ka faa'iideysan karnaa

aqoonta aan u leenahay isudhignaanta jajabyada. Markaa, waxaan horta raadineynaa jajab hooseeyihiisu yahay $\frac{4}{4}$ oo u

dhigma $\frac{1}{2}$. Jajabkaa isaga ahi waa $\frac{2}{4}$. Deeto, waxan isu-

geyneynaa $\frac{2}{4}$ iyo $\frac{3}{4}$.

Markaa,

$$\frac{1}{2} + \frac{3}{4} = \frac{2}{4} + \frac{3}{4} = \frac{5}{4}$$

Hadda isugee $\frac{1}{2}$ iyo $\frac{3}{8}$. Sidii tii hore oo kale raadi

jajab hooseeyihiisu yahay 8 oo u dhigma $\frac{1}{2}$. Jajabkaasi waa $\frac{4}{8}$. Markaa

$$\frac{1}{2} + \frac{3}{8} = \frac{4}{8} + \frac{3}{8} = \frac{7}{8}$$

Layli : Isugee

$$(1) \frac{1}{2} + \frac{4}{6} \quad (2) \frac{1}{3} + \frac{5}{6} \quad (3) \frac{2}{3} + \frac{5}{9}$$

$$(4) \frac{3}{7} + \frac{5}{14} \quad (5) \frac{4}{5} + \frac{1}{15} \quad (6) \frac{5}{6} + \frac{17}{18}$$

$$(7) \frac{2}{5} + \frac{3}{10} \quad (8) \frac{6}{20} + \frac{39}{100} \quad (9) \frac{1}{12} + \frac{1}{100}$$

$$(10) \frac{1}{132} + \frac{5}{11}$$

Haddaba, markii aad isugeyneysay $\frac{2}{5}$ iyo $\frac{3}{10}$ oo kale,

$$\text{sidan baad yeeshay } \frac{2}{5} + \frac{3}{10} = \frac{4}{10} + \frac{3}{10} = \frac{7}{10}$$

Markaa, labadii jajab baad u raadisey hooseeye ay wadaagaan. Haddaan doonno inaan isugeynno $\frac{1}{2}$ iyo $\frac{1}{3}$, waa

inaan helnaa hooseeye ay labada jajab wadaagaan. Waxan naqaan in jajabyada u dhigma $\frac{1}{2}$ ay yihiin $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$,

$\frac{6}{12}$, ururka jajabyada u dhigma $\frac{1}{3}$ na waa :

$$\frac{2}{6}, \frac{3}{9}, \frac{4}{12}, \frac{5}{15}, \frac{6}{18}, \dots \text{ Markaa, jajabyada labadaa}$$

jajab u dhigma ee isku hooseeyaha ah waxa ka mid ah

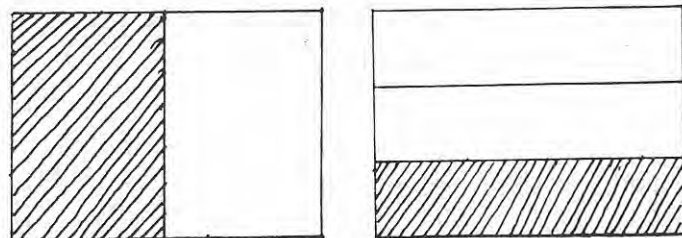
$\frac{3}{6}$ iyo $\frac{2}{6}$, $\frac{6}{12}$ iyo $\frac{4}{12}$, $\frac{9}{18}$ iyo $\frac{6}{18}$, $\frac{12}{24}$ iyo $\frac{8}{24}$. Markaa

hooseeyaha ugu yar ee ay wadaagaan $\frac{1}{2}$ iyo $\frac{1}{3}$ waa 6.

Markaa,

$$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

Jaantusyadan baa innoo caddaynaya jawaabta aan helnay. Taswiir laba laydi oo is cabbir le'eg

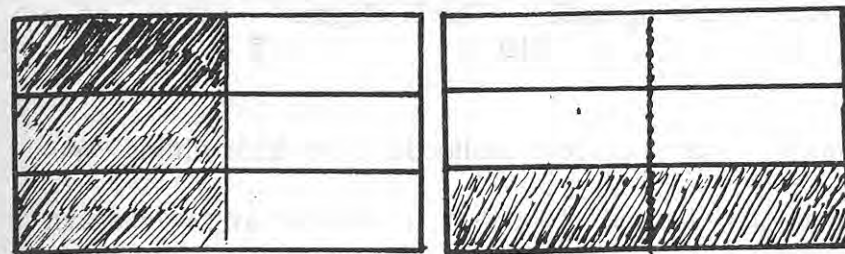


$$\frac{1}{2} \qquad \frac{1}{3}$$

Laydiga muujinaya $\frac{1}{2}$ waxa kala badha xarriijin qotonta,

ka muujinaya $\frac{1}{3}$ na waxa qaybiyey xarriijimo jiifa. Markaa

haddii aan laydigahore xarriijimo jiifa ugu sii qaybino 3 qaybood, ka kalana xarriijin qotonta ku kala badhno, labada laydi mid waliba wuxu u qaybsamayaa 6 qaybood oo isle'eg.



$$\frac{1}{2}$$

$$\frac{1}{3}$$

Markaa, laydiga hore inta hadhaysani waa $\frac{3}{6}$, ka dambe

inta hadhaysanina waa $\frac{2}{6}$. Sidaa awgeed

$$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

Tusaale :

$$\text{Isugee } \frac{3}{5} \text{ iyo } \frac{1}{3}$$

Furfurid :

Jajabyada uu u dhigmo jajabka $\frac{3}{5}$ waa ururka

$$\left\{ \frac{6}{10}, \frac{9}{15}, \frac{12}{20}, \frac{15}{25}, \dots \right\}, \text{ jajabyada uu u dhigmo jajabka } \frac{1}{3}$$

$$\text{na waa ururka } \left\{ \frac{2}{6}, \frac{3}{9}, \frac{4}{12}, \frac{5}{15}, \frac{6}{18}, \dots \right\}$$

Waxaa inoo muuqda $\frac{9}{15}$ oo u dhigma $\frac{3}{5}$ iyo $\frac{5}{15}$ oo u

dhigma $\frac{1}{3}$ inay hooseeyayaashoodu isku mid yihiin. Waxaan odhan karnaa hooseeye u yaraha ay wadaagaan

$\frac{3}{5}$ iyo $\frac{1}{3}$ waa 15.

Markaa,
$$\frac{3}{5} + \frac{1}{3} = \frac{9}{15} + \frac{5}{15} = \frac{14}{15}$$

Tusaale :

Isugee $\frac{5}{6}$ iyo $\frac{3}{8}$

Jajabyada ay isudhigmaan $\frac{5}{6}$ waa ururka

$$\left\{ \frac{5}{6}, \frac{10}{12}, \frac{15}{18}, \frac{20}{24}, \dots \right\}$$

Jajabyada ay isu dhigmaan $\frac{3}{8}$ na waa ururka

$$\left\{ \frac{3}{8}, \frac{6}{16}, \frac{9}{24}, \frac{12}{32}, \dots \right\}$$

Markaa, hooseeye u yaraha ay wadaagaan $\frac{3}{8}$ iyo $\frac{5}{6}$ waa

24. Sidaa awgeed,

$$\frac{5}{6} + \frac{3}{8} = \frac{20}{24} + \frac{9}{24} = \frac{29}{24}$$

Waxa kale oo aan yeeli karnaa, inaan horta raadinno hooseeye u yaraha ay wadaagaan $\frac{5}{6}$ iyo $\frac{3}{8}$.

Hooseeye u yaraha laba jajab wadaagaani (H.Y.W.) waxaa weeye Dh.Y.W. labada jajab hooseeyayaashoodu. Marka haddaba aan raadineyno H.Y.W. $\frac{5}{6}$ iyo $\frac{3}{8}$, waa inaan raadinaa uun Dh.Y.W. 6 iyo 8 Dh.Y.W. 6 iyo 8 waa 24. Haddana waxaan baadi dooneynaa jajab hooseeyihiisu yahay 24 oo u dhigma $\frac{5}{6}$ iyo jajab u dhigma $\frac{3}{8}$ oo hooseeyihiisu

yahay 24. Ka hore waa $\frac{20}{24}$, ka dambena waa $\frac{9}{24}$.

Markaa,

$$\frac{5}{6} + \frac{3}{8} = \frac{20}{24} + \frac{9}{24} = \frac{29}{24}$$

Haddaan si kalc u dhigno isle'egtaa waxaan helnaa

$$\frac{5}{6} + \frac{3}{8} = \frac{20}{24} + \frac{9}{24} = \frac{20+9}{24} = \frac{(5 \times 4) + (3 \times 3)}{24}$$

Markaa,
$$\frac{5}{6} + \frac{3}{8} = \frac{(5 \times 4) + (3 \times 3)}{24}$$

isle'egta u dambeysa waxa kaaga muuqda in hooseeyaha

dhinaca midigtu yahay H.Y.W. $\frac{5}{6}$ iyo $\frac{3}{8}$. Sarreeyaha

$(5 \times 4) + (3 \times 3)$ waxa weeye wadarta sarreeyaha $\frac{5}{6}$ oo

lagu dhuufatay $24 \div 6$ iyo sarreeyaha $\frac{3}{8}$ oo lagu dhufatay $24 \div 8$.

Haddaba balaanisku dayno inaan isugeynno $\frac{2}{9}$ iyo $\frac{4}{15}$

H.Y.W. $\frac{2}{9}$ iyo $\frac{4}{15}$ raadi. Ma yahay 45? Haa.

$$\text{Markaa, } \frac{2}{9} + \frac{4}{15} = \frac{(2 \times 5) + (4 \times 3)}{45} = \frac{10 + 12}{45} = \frac{22}{45}$$

$$\text{Markaa, } \frac{2}{9} + \frac{4}{15} = \frac{22}{45}$$

Layli : Isugee

$$(1) \frac{7}{10} + \frac{5}{4} \quad (2) 1\frac{7}{8} + \frac{2}{9} \quad (3) \frac{3}{8} + \frac{7}{36}$$

$$(4) \frac{5}{12} + \frac{1}{18} \quad (5) \frac{3}{25} + \frac{12}{105} \quad (6) \frac{1}{3} + \frac{11}{12}$$

$$(7) \frac{13}{24} + \frac{15}{16} \quad (8) \frac{17}{30} + \frac{14}{45} \quad (9) \frac{29}{39} + \frac{15}{52}$$

$$(10) \frac{37}{144} + \frac{25}{324}$$

Isugeynta saddex Jajab

Haddaan isugeyneynno $\frac{1}{3}$, $\frac{1}{4}$, iyo $\frac{2}{5}$, waa inaan sidii awal horta H.Y.W. saddexda jajab raadinnaa.

H.Y.W. $\frac{1}{3}$, $\frac{1}{4}$, iyo $\frac{2}{5}$ waa taranta 3, 4, iyo 5 oo ah 60.

$$\text{Markaa, } \frac{1}{3} + \frac{1}{4} + \frac{2}{5}$$

$$= \frac{(1 \times 20) + (1 \times 15) + (2 \times 12)}{60} = \frac{20 + 15 + 24}{60} = \frac{59}{60}$$

Tusaale :

$$\text{Raadi wadarta } \frac{7}{10}, \frac{5}{4} \text{ iyo } \frac{3}{8}$$

Furfurid :

Horta an raadinno H.Y.W. $\frac{7}{10}$, $\frac{5}{4}$ iyo $\frac{3}{8}$.

H.Y.W. jajabyadaasi waxa weeye Dh.Y.W., 10, 4 iyo 8.

Dh.Y.W. tirooyinkaasina sidan baan u soo saari karnaa:

$$\begin{array}{c|ccc} 2 & 4, & 8, & 10 \\ 2 & 2, & 4, & 5 \\ 2 & 1, & 2, & 5 \\ 5 & 1, & 1, & 5 \\ & 1, & 1, & 1 \end{array}$$

Dh.Y.W. 4, 8 iyo 10 waa $2 \times 2 \times 2 \times 5 = 40$.

Markaa, H.Y.W. $\frac{7}{10}$, $\frac{5}{4}$ iyo $\frac{3}{8}$ waa 40.

Sidaa daraadeed

$$\begin{array}{r} 7 \quad 5 \quad 3 \\ + \quad + \quad + \\ 10 \quad 4 \quad 8 \end{array} = \frac{(7 \times 4) + (5 \times 10) + (3 \times 5)}{40}$$

$$= \frac{28 + 50 + 15}{40} = \frac{93}{40}$$

93
na waxa loo qori karaa $\frac{2}{40}$

Layli : Isugee

- | | | | |
|-----|---|-----|--|
| (1) | $\frac{15}{8} + \frac{9}{3} + \frac{5}{6}$ | (2) | $\frac{3}{4} + \frac{5}{12} + \frac{1}{36}$ |
| (3) | $\frac{29}{25} + \frac{1}{15} + \frac{7}{30}$ | (4) | $\frac{7}{16} + \frac{5}{17} + \frac{3}{28}$ |
| (5) | $\frac{12}{35} + \frac{3}{14} + \frac{4}{21}$ | | |

Kala goynta Jajabyada

Isugeynta iyo kala goynta xidhiidhka ka dhexeeya, oo ah isweydaarnimada, haddaad xasuusan tahay, dhibaato kala kulmi meysid kala goynta jajabyada. Marka aad laba jajab isugeyneysa waxa horta la soo saaraa, sidii aynu horeba u

nidhi, H.Y.W. laba jajab. Si aad isugugeyso $\frac{5}{7} + \frac{13}{10}$

raadi H.Y.W. iyo $\frac{5}{7}$ H.Y.W. iyo $\frac{13}{10}$ waa 70.

Markaa,

$$\begin{array}{r} 5 \quad 13 \\ + \quad + \\ 7 \quad 10 \end{array} = \frac{(5 \times 10) + (13 \times 7)}{70} = \frac{50 + 91}{70} = \frac{141}{70} = 2 \frac{1}{70}$$

Isla hilinkaas baa la isticmaali karaa haddii laba jajab la kala goynayo. Kol haddii isugeynta iyo kala goyntu ay yihiin isweydaar, biirada ka maqan isleegtan tirooyinka idil ah ee

$\frac{35}{70} + \frac{28}{70} = \frac{63}{70}$
waxa lagu helaa kala goyn. isleegtiina sidan baa loo qori karaa $\frac{63}{70} = \frac{9}{10}$.

Innagoo hilinkaa isticmaalayna, ayaan masalooyinka jaad kan soo socda ah furfuri karnaa.

$$\frac{5}{3} + \frac{9}{3} = \frac{14}{3}$$

Biirada maqani waa jajab ay tahay in loo geeyo $\frac{3}{5}$ si loo helo wadar ah $\frac{9}{3}$

Waad arki kartaa in jajabka maqani yahay $\frac{4}{3}$ oo ay

weedhani run tahay:

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

Weedhahaasi waxay isu dhigmaan weedha

$$\frac{9}{3} - \frac{5}{3} = \frac{4}{3}$$

Markaa way kuu muuqataa in marka aan dooneyno inaan $\frac{5}{3}$ ka goyno $\frac{9}{3}$ an isticmaali karno H.Y.W. $\frac{9}{3}$ iyo $\frac{5}{3}$, oon sidan yeeli karno

$$\frac{9}{3} - \frac{5}{3} = \frac{9-5}{3} = \frac{4}{3}$$

Masalo tii hore ka yara kakan aan qaadanno :

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

Si aan u helno tirada jagada xarriijinta geli karta, waxan ka faa'iideysaneynaa isweydaarnimada isugeynta iyo kala

goynta. Markaa $\frac{8}{3} - \frac{5}{4}$. Sidii masaladii hore

iyaan la soo bixi karnaa H.Y.W. labada jajib, deetana waxan suubinaynaa xisaabfalka kala goynta.

H.Y.W. $\frac{8}{3}$ iyo $\frac{5}{4}$ waa 12. Sidaa awgeed.

$$\frac{8}{3} - \frac{5}{4} = \frac{(8 \times 4) - (5 \times 3)}{12} = \frac{32 - 15}{12} = \frac{17}{12}$$

Layli :

A. Raadi biirooyinka xarfuhu u taagan yihiin :

$$(1) \frac{3}{2} + B = \frac{5}{3} \quad (2) 1\frac{5}{8} = K + \frac{4}{4}$$

$$(3) 1\frac{7}{10} + M = 5\frac{5}{10} \quad (4) D + 2\frac{3}{10} = \frac{16}{5}$$

$$(5) \frac{23}{7} + X = \frac{41}{4} \quad (6) 3\frac{9}{10} + N = 7\frac{3}{4}$$

$$(7) C + \frac{7}{8} = \frac{14}{16}$$

B. Raadi H.Y.W., deetana kala goo jajabyadan.

$$(1) 16\frac{5}{6} - 7\frac{3}{8} \quad (2) 10\frac{3}{4} - 7\frac{2}{5}$$

$$(3) 32\frac{5}{6} - 7\frac{5}{8} \quad (4) 52\frac{3}{5} - 5\frac{1}{3}$$

$$(7) 17\frac{1}{4} - 6\frac{5}{8} \quad (8) \frac{7}{5} - \frac{11}{9}$$

$$(9) \left\{ 2\frac{5}{6} - 1\frac{1}{6} \right\} + \frac{4}{5} \quad (10) 15\frac{3}{4} - 6\frac{1}{8}$$

C. (1) Weel baa muggiisu yahay $6\frac{1}{4}$ galaan. Immi-

sa galaan oo kale ayaa buuxinaya weelkaa haddii ay

ku jiraan $2\frac{7}{10}$ galaan?

(2) Caasha iyo Faadumo ayaa shaqo wada qaba-

nayey. Caasha galab bay shaqaysay saacad $\frac{3}{4}$ deed,

galab kalana waxay shaqaysay $1\frac{1}{3}$ saacadood.

Faadumana galab Jimce ayay shaqaysay $2\frac{4}{5}$ saaca-

dood. Waqti intee dhan bay Faadumo Caasha dheerayd?

(3) Qori dhererkiisu ahaa $4\frac{4}{5}$ mitir baa laga ja-

ray gobol dhererkiisu yahay $2\frac{3}{4}$ mitir. Qorigii

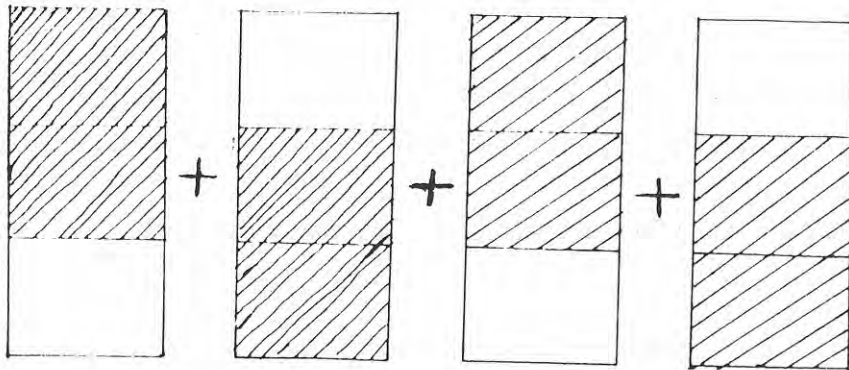
imisa mitir baa ka soo hadhay?

Iskudhufashada Jajabyada

Iskudhufashada tirooyinka idil waxaad xasuusan tahay inaan ku qeexnay isugeyn noqnoqoto ah. Fikraddaasi waxay inaga caawinaysaa isku dhufashada tirooyinka idil iyo jajabyada. Ka fikir hadda wadartan :

$$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3}$$

Wadartan sidan baan u sawiri karnaa



Jaantuska waxa ka muuqda in

$$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{8}{3}$$

waxana loo qori karaa

$$\frac{(2+2+2+2)}{3} = \frac{8}{3} \text{ oo la mid ah } \frac{(4 \times 2)}{3} = \frac{8}{3}$$

laakiin sidii iskudhufashada tirooyinka idil, isleegta sare waxan u dhigi karnaa :

$$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = 4 \times \frac{2}{3}$$

Marka, aad rabto in aad isku dhufato jajab iyo tiro idil, isku dhufo **sarreeyaha** jajabka iyo tirada idil, hooseeyahana ha **beddelin**.

$$4 \times \frac{2}{3} = \frac{(4 \times 2)}{3}$$

Tusaale kale u qaado taranta $7 \times 5\frac{3}{8}$. Si aad taranta

u hesho, waa inaad horta tirada dhafan u rogtaa jajab ma qummanaha $27/8$.

Deetana waxad heleysaa

$$7 \times 5\frac{3}{8} = 7 \times \frac{27}{8} = \frac{(7 \times 27)}{8} = \frac{189}{8}$$

Tusaale kalena wuxu yahay

$$6 \times 3\frac{4}{10}$$

$$6 \times 3 \frac{4}{10} = 6 \times \frac{34}{10} = \frac{204}{10} = 20 \frac{4}{10}$$

Layli :

Raadi jawaabaha masalooyinkan iskudhufashada ah.

$$(1) 7 \times \frac{5}{8} \quad (2) 4 \times \frac{3}{4} \quad (3) 13 \times \frac{2}{10}$$

$$(4) 5 \times 7 \frac{2}{10} \quad (5) 85 \times \frac{27}{4} \quad (6) 32 \times \frac{5}{8}$$

Haddii sarreeyaha iyo hooseeyuhu ay leeyihiin isirro ay wadaagaan waxan yeeli karnaa inaan sarreeyaha iyo hooseeyahaba isirradaa u qaybino.

Metelan, masalada (6) ee layliga sare waxad u furfuri kartaa

$$32 \times \frac{5}{8} = \frac{(32 \times 5)}{8} = \frac{160}{8}$$

Iaakiin, haddaan isticmaalno fikradda isudhignaanta jajabya-

$$\text{da, waxan arkaynaa in } \frac{160}{8} = \frac{20}{1} = 20 \text{ \textcircled{e}}$$

Isirrada ay sarreeyaha iyo hooseeyuhu wadaagaan haddaan isuqaybinayna waxan heleynaa

$$\frac{160}{8} = \frac{8 \times 20}{8} = \frac{8}{8} \times 20 = 1 \times 20 = 20$$

$$\text{Tusaale kale aan u qaadanno taranta } 16 \times \frac{5}{12}$$

$$16 \times \frac{5}{12} = \frac{(16 \times 5)}{12} = \frac{80}{12}$$

Waad taqaan in $80 = 4 \times 20$, iyo $12 = 4 \times 3$, markaa

$$\frac{80}{12} = \frac{(4 \times 20)}{(4 \times 3)} = \frac{20}{3}$$

Layli :

Hilinkan dambe adigoo isticmaalaya isku dhufo jajabyadan iyo tirooyinka idil.

$$(1) 15 \times \frac{5}{3} \quad (2) 18 \times \frac{16}{13} \quad (3) 25 \times 7 \frac{1}{5}$$

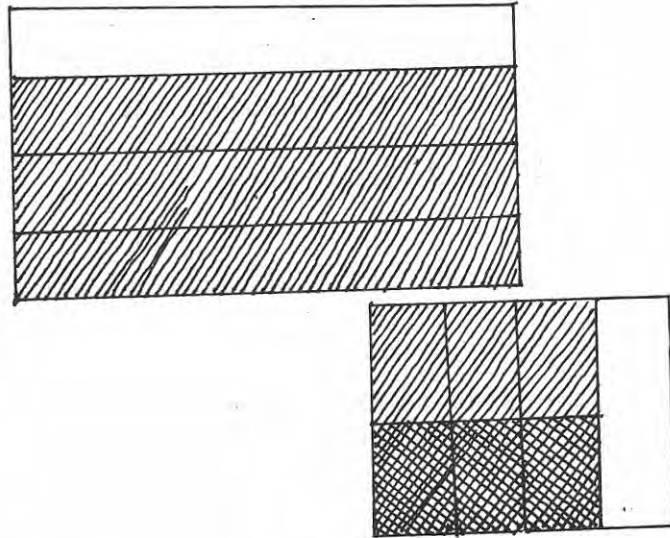
$$(4) 30 \times 5 \frac{7}{10} \quad (5) 14 \times 3 \frac{2}{7} \quad (6) 2 \times 5 \frac{6}{10}$$

Isku dhufashada laba jajab :

Isku dhufashada tirooyinka idil iyo jajabyada waxa ka

$$\text{yara kakan iskudhufashada laba jajab. Metelan, } \frac{1}{2} \times \frac{3}{4}$$

Bal hadda u fiirso jaantuskan :



$$\frac{3}{4}$$

$\frac{3}{4}$ badhkeedna waxa muujinaya jaantuskan.

Markaa, gobolka sida culus u midabaysan baa muujinaya

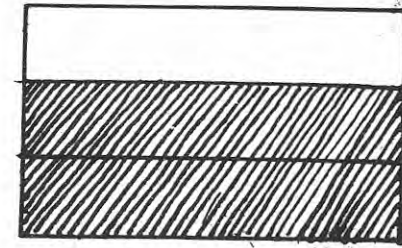
$$\frac{1}{2} \text{ ka } \frac{3}{4} \text{ Haddaan tirinnana waxa weeye jaantuska } \frac{3}{8} \text{ dii}$$

Sidaa awgeed $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$.

Hadda, tusaale kale ahaan, aan raadinno

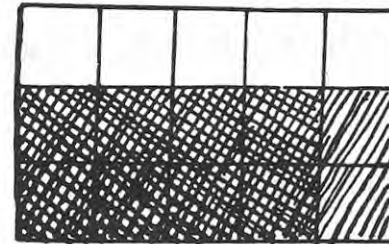
$$\frac{4}{5} \times \frac{2}{3}$$

Horta xaashi cad xarriijimo jiifa ugu qaybi saddex meeloood oo isleeg.



$$\frac{2}{3}$$

Deetana xarriijimo qotoma 5 gobol ugu qaybi xaashida. Markaa waxaa soo baxaya



$$\frac{4}{5} \times \frac{2}{3}$$

8 da gobol ee aad u hadhaysan baa tilmaamaya $\frac{4}{5} \times \frac{2}{3}$

Markaa

$$\frac{4}{5} \times \frac{2}{3} = \frac{8}{15}$$

Layli :

Adigoo jaantusyo isticmaalaya raadi :

$$(1) \frac{1}{2} \times \frac{5}{6} \quad (2) \frac{2}{3} \times \frac{4}{5} \quad (3) \frac{5}{6} \times \frac{1}{2}$$

$$(4) \frac{1}{7} \times \frac{2}{3} \quad (5) \frac{1}{5} \times \frac{1}{2} \quad (6) \frac{4}{5} \times \frac{1}{3}$$

$$(7) \frac{2}{5} \times \frac{3}{5} \quad (8) \frac{3}{8} \times \frac{1}{2} \quad (9) \frac{2}{7} \times \frac{3}{7}$$

$$(10) \frac{3}{4} \times \frac{1}{4} \quad (11) \frac{2}{3} \times \frac{1}{4}$$

Masalada 11 aad waxad ka ogaatay in $\frac{2}{3} \times \frac{1}{4} = \frac{2}{12}$

Waxaanad taqaan in jajabkaa $\frac{2}{12}$ jajab ka sansaan fudud

oo u dhigmaa u jiro, loona heli karo sidan: $\frac{2}{12} = \frac{1 \times 2}{6 \times 2} = \frac{1}{6}$

Markaa jajabka $\frac{1}{6}$ baa la qatey in jawaab ahaan loo

qoro. Had iyo jeer, marka aad jajab jawaab ahaan u hesho, iskuday in aad jajabkaa sansaanta ugu fudud u qortid. Layligii sare ee aad taranta jajabyada ku soo saareysey masawirrada, haddaan ku yara laabanno, oo aan dhawr tusaale ka qaadano, sida :

$$\frac{1}{2} \times \frac{5}{6} = \frac{5}{12}, \quad \frac{2}{3} \times \frac{4}{5} = \frac{8}{15}, \quad \frac{5}{6} \times \frac{1}{2} = \frac{5}{12}$$

waxan arkaynaa in taranta laba jajab ay tahay jajab kale, oo sarreeyihiisu yahay labada jajab sarreeyeyaashooda oo la isku dhufto, hooseeyihiisuna yahay labada jajab hooseeyeyaashooda

oo la isku dhufto. Jajabkaa an helnay haddii sarreeyihiisa iyo hooseeyihiisu ay isirro wadaagaan waan fududayn karnaa sida

$$\frac{4}{15} \times \frac{3}{2} = \frac{12}{30}$$

$$\frac{12}{30} = \frac{6 \times 2}{6 \times 5} = \frac{6}{6} \times \frac{2}{5} = \frac{2}{5}$$

Markaa, $\frac{4}{15} \times \frac{3}{2} = \frac{12}{30} = \frac{2}{5}$

Layli :

Raadi taramaha oo u dhig sansaanta ugu fudud :

$$(1) \frac{7}{10} \times \frac{2}{3} \quad (2) \frac{8}{9} \times \frac{3}{4} \quad (3) \frac{3}{8} \times \frac{2}{9}$$

$$(4) \frac{2}{5} \times \frac{5}{6} \quad (5) \frac{3}{5} \times \frac{1}{6} \quad (6) \frac{5}{9} \times \frac{4}{5}$$

$$(7) \frac{7}{8} \times \frac{2}{7} \quad (8) \frac{1}{3} \times \frac{3}{10}$$

Isku dhufashada saddex Jajab

Haddii aan haysanno masalada $\left\{ \frac{1}{3} \times \frac{5}{2} \right\} \times \frac{1}{4}$ biluhu

waxay tilmaamayaan in horta la isku dhufto $\frac{1}{3}$ iyo $\frac{5}{2}$

deetana taranta la helo lagu dhufto $\frac{1}{4}$.

Markaa, $\left\{ \frac{1}{3} \times \frac{5}{2} \right\} \times \frac{1}{4} = \frac{5}{6} \times \frac{1}{4} = \frac{5}{24}$.

Tusaale :

Raadi taranta

$$\frac{3}{4} \times \left\{ \frac{1}{2} \times \frac{7}{5} \right\}$$

Furfurid :

$$\frac{3}{4} \times \left\{ \frac{1}{2} \times \frac{7}{5} \right\} = \frac{3}{4} \times \frac{7}{10} = \frac{21}{40}$$

Tusaale kale : Raadi taranta

$$\left\{ \frac{3}{4} \times \frac{1}{2} \right\} \times \frac{7}{5}$$

Furfurid :

$$\left\{ \frac{3}{4} \times \frac{1}{2} \right\} \times \frac{7}{5} = \frac{3}{8} \times \frac{7}{5} = \frac{21}{40}$$

Haddii tusaalahan dambe aan ka siibno bilaha waxa ina-

gu soo hadhaya $\frac{3}{4} \times \frac{1}{2} \times \frac{7}{5}$. Tarantana waxa lagu heli

karaa in sarreeyayaashana la isku dhufto, hooseeyayaashana la sku dhufto.

Markaa :

$$\frac{3}{4} \times \frac{1}{2} \times \frac{7}{5} = \frac{3 \times 1 \times 7}{4 \times 2 \times 5} = \frac{21}{40}$$

Layli :

Isku dhufo jajabyadan :

(1) $\frac{7}{3} \times \frac{1}{2} \times \frac{5}{2}$ (2) $\frac{7}{3} \times \frac{1}{5} \times \frac{7}{2}$

(3) $\frac{2}{7} \times \frac{3}{5} \times \frac{4}{3}$ (4) $\frac{1}{3} \times \frac{4}{5} \times \frac{3}{2}$

(5) $\frac{2}{3} \times \frac{5}{7} \times \frac{8}{9} \times \frac{1}{2}$

Hilin gaaban : Isku jarjar

Tirooyinka $\frac{6}{6}, \frac{5}{5}, \frac{4}{4}, \frac{3}{3}, \frac{2}{2}$ iyo $\frac{100}{100}$

mid waliba inuu yahay magac kale oo uu leeyahay 1 baad taqaan.

Bal aynu eegno fikraddaasi inay innaga caawin karto isku dhufashada jajabyada.

$$\frac{6}{5} \times \frac{3}{4} = \frac{18}{20}$$

18 waxan u qori karnaa 2×9 . 20 na waxan u dhigi karnaa 2×10 . Markaa :

$$\frac{18}{20} = \frac{2 \times 9}{2 \times 10} = \frac{2}{2} \times \frac{9}{10} = 1 \times \frac{9}{10} = \frac{9}{10}$$

Sidani waxay innoogu stura gashay 2 isir buu u yahay sarreeyayaasha oo mid ah iyo hooseeyayaasha midkood. Markaa

$$\text{isirkaa ay wadaagaan baan ka samaynnay tirada } \frac{2}{2}$$

Tusaale :

Isku dhufo jajabyadan oo fududee jawaabta :

$$(b) \frac{35}{4} \times \frac{1}{5} \quad (t) \frac{4}{3} \times \frac{7}{8} \quad (j) \frac{3}{7} \times \frac{5}{9}$$

Furfurid :

$$(b) \frac{35}{4} \times \frac{1}{5} = \frac{35}{20}$$

$$= \frac{5 \times 7}{5 \times 4}$$

$$= \frac{5}{5} \times \frac{7}{4} = \frac{7}{4}$$

$$(t) \frac{4}{3} \times \frac{7}{8} = \frac{28}{24}$$

$$= \frac{4 \times 7}{4 \times 6}$$

$$= \frac{4}{4} \times \frac{7}{6} = \frac{7}{6}$$

$$(j) \frac{3}{7} \times \frac{5}{9} = \frac{15}{63}$$

$$= \frac{3 \times 5}{3 \times 21}$$

$$= \frac{3}{3} \times \frac{5}{21} = \frac{5}{21}$$

Haddii aan sidaa uga fikirno isirrada sarreeyayaasha iyo hooseeyayaasha jajabyada la isku dhufanayo, hawsha waan fududayn karaynaa. Marka aan laba jajab isku dhufanayno, waxaan horta raadin karnaa isirrada ay sarreeyayaasha iyo hooseeyayaashu wadaagaan, deetana waxan u qaadanaynaa inay yihiin jajab u taagan 1. Tusaalooyinkan u fiirso.

$$(b) \frac{2}{3} \times \frac{5}{16}$$

$$\frac{\cancel{2}}{3} \times \frac{5}{\cancel{16}} = \frac{1 \times 5}{3 \times 8} = \frac{5}{24}$$

$$(t) \frac{\cancel{15}}{\cancel{4}} \times \frac{\cancel{4}}{\cancel{9}}$$

$$\frac{5}{15} \times \frac{1}{4} = \frac{5 \times 1}{1 \times 3} = \frac{5}{3}$$

$$(j) \frac{35}{4} \times \frac{1}{5}$$

$$\frac{\cancel{35}}{4} \times \frac{1}{\cancel{5}} = \frac{7 \times 1}{4 \times 1} = \frac{7}{4}$$

Tusaalaha «b», 2 ayaa isir u ah 2 iyo 16. Isirkaa ay

wadaagaan waxan uga fikiri karnaa inuu u taagan yahay $\frac{2}{2}$,

oo aan beddeleyn taranta. Si aan u xasuusan karno waxa aan suubbinayno, 2 iyo 16 kaba waxaan u qaybinay 2. Waa intee $2 \div 2$? $16 \div 2$? Calaamadda (/) waxay tilmaamay-saa isuqaybinta isirradaa. Labada tusaale ee kalana hiliinkaasi baan raacnay.

Layli :

(1) $1\frac{1}{2} \times 1\frac{3}{5}$ (2) $\frac{9}{7} \times \frac{7}{3}$ (3) $\frac{2}{9} \times \frac{4}{5}$

(4) $3\frac{1}{6} \times 1\frac{5}{7}$ (5) $5\frac{1}{3} \times 1\frac{1}{16}$ (6) $1\frac{1}{9} \times 2\frac{1}{10}$

(7) $2\frac{1}{5} \times 1\frac{5}{12}$ (8) $\frac{5}{9} \times \frac{3}{10}$ (9) $7\frac{1}{2} \times 2\frac{2}{5}$

(10) $2\frac{5}{8} \times 1\frac{1}{3}$ (11) $1\frac{2}{3} \times 5\frac{1}{5}$ (12) $3\frac{1}{6} \times 1\frac{1}{5}$

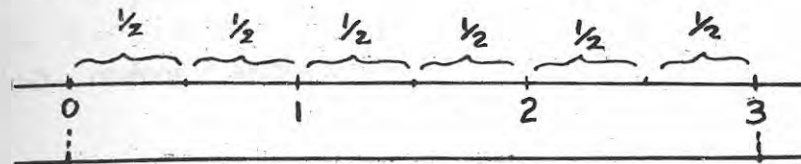
(13) $\frac{5}{6} \times \frac{4}{5} \times \frac{1}{2}$ (14) $\frac{2}{3} \times \frac{1}{2} \times \frac{3}{4}$ (15) $3\frac{7}{8} \times 4$

Isuqaybinta Jajabyada

Isuqaybinta $12 \div 2$ waxan u qaadan karnaa inay tahay inta 2 ee ku jirta 12. Sidaas oo kale $3 \div \frac{1}{2}$ waxa weeye inta

$\frac{1}{2}$ ee ku jira 3. Si aad u garato inta $1/2$ ee ku jira 3 soo qaa-

do loox, u qaybi 3 qaybood, qayb walbana kala badh, sida jaantuskani muujinayo.



Markaa, haddaad tiriso inta badh ee ku jira 3 waa 6.

Sidaa awgeed $3 \div \frac{1}{2} = 6$.

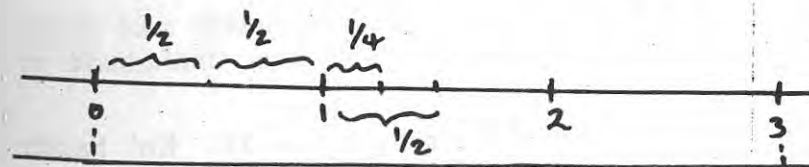
Layli :

Adigoo isticmaalaya hilinkan sare oo kale, raadi :

(b) $2 \div \frac{1}{4}$ (t) $2 \div \frac{1}{2}$ (j) $\frac{5}{2} \div \frac{1}{2}$ (x) $3 \div \frac{3}{4}$

(kh) $1 \div \frac{1}{2}$ (d) $1\frac{1}{2} \div \frac{1}{1}$

Iminka aan isku dayno inaan raadino $1\frac{1}{4} \div \frac{1}{2}$



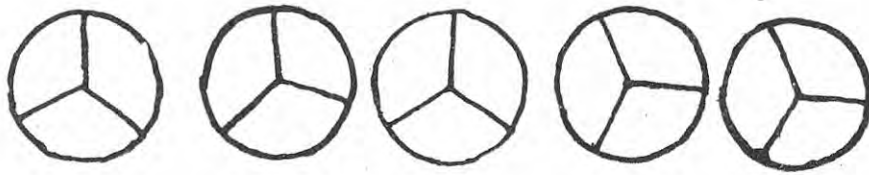
Waxa jaantuskan innooga muuqda in $1\frac{1}{4}$ ay ku jiraan

laba $\frac{1}{2}$ iyo $\frac{1}{2}$ badhki. Markaa, $1\frac{1}{4} \div \frac{1}{2} = 2\frac{1}{2}$

Aan eegno $5 \div \frac{1}{3}$. Waxaad sawirtaa 5 gooboo. Goo-

bo walba u qaybi 3 qaybood. Tiri inta $\frac{1}{3}$ ee goobo walba ku jira.

Shanta goobo immisa $\frac{1}{3}$ oo goobo ayaa ku jira? waa 15.



Markaa $5 \div \frac{1}{3} = 15$.

Waxaan helnay in $5 \div \frac{1}{3} = 15$ markaan tirinay. Laa-

kiin haddaan ka faa'iideysano isweydaarnimada isku dhufashada iyo isuqaybinta, iyo hubaalaha isku dhufashada ee

$15 \times \frac{1}{3} = 5$, waxa dhab ah in $5 \div \frac{1}{3} = 15$. Kol haddii

$8 \times \frac{1}{2} = 4$, $4 \div \frac{1}{2} = 8$, weedhan soo socotaa run ma

tahay: $21 \times \frac{1}{3} = 7$? Runse matahay $7 \div \frac{1}{3} = 21$? Mar-

kaa $5 \div \frac{1}{3} = 5 \times \frac{3}{1} = 15$, $7 \div \frac{1}{3} = 21 = 7 \times \frac{3}{1}$.

Sidaa oo kale isuqaybinta labada jajib ee $\frac{5}{4} \div \frac{1}{2}$ waxa

loo qori karaa $\frac{5}{4} \times \frac{2}{1}$.

Markaa $\frac{5}{4} \div \frac{1}{2} = \frac{5}{4} \times \frac{2}{1} = \frac{5}{2}$

Tusaale :

Isu qaybi $\frac{5}{6} \div \frac{4}{3}$

Furfurid :

Labada siyoodba waan u furfuri karnaa masaladan :

(b) $\frac{5}{6} \div \frac{4}{3} = \frac{5}{6} \times \frac{3}{4} = \frac{5}{2} \times \frac{1}{4} = \frac{5 \times 1}{2 \times 4} = \frac{5}{8}$

$$= \frac{3 \times 5}{3 \times 8} = \frac{5}{8}$$

$$= \frac{3}{3} \times \frac{5}{8}$$

$$= 1 \times \frac{5}{8} = \frac{5}{8}$$

Haddaad u fiirsato hilinka (t) waa hilinka (b) oo la soo gaabshay. Markaa, waxa fudud masalo tan sare oo kale ah marka aad furfurayso inaad hilinka (t) isticmaashid.

Layli :

Isu qaybi oo hilinka gaaban raac.

- | | | | | | |
|------|------------------------------------|------|-----------------------------------|------|-----------------------------------|
| (1) | $12 \div \frac{1}{2}$ | (2) | $9 \div \frac{1}{4}$ | (3) | $42 \div \frac{1}{7}$ |
| (4) | $\frac{9}{4} \div \frac{1}{2}$ | (5) | $\frac{3}{10} \div \frac{4}{5}$ | (6) | $\frac{2}{12} \div \frac{1}{6}$ |
| (7) | $\frac{2}{3} \div \frac{1}{3}$ | (8) | $\frac{3}{5} \div \frac{5}{6}$ | (9) | $\frac{7}{8} \div \frac{5}{16}$ |
| (10) | $9 \div 2 \frac{2}{5}$ | (11) | $4 \frac{1}{3} \div 3$ | (12) | $4 \frac{1}{6} \div \frac{1}{12}$ |
| (13) | $6 \frac{4}{5} \div \frac{2}{10}$ | (14) | $3 \frac{2}{3} \div \frac{1}{6}$ | (15) | $\frac{5}{5} \div 1 \frac{1}{4}$ |
| (16) | $6 \frac{1}{8} \div 1 \frac{3}{4}$ | (17) | $12 \frac{1}{2} \div \frac{5}{6}$ | (18) | $10 \frac{1}{2} \div \frac{1}{3}$ |
| (19) | $7 \div \frac{7}{16}$ | (20) | $\frac{5}{8} \div \frac{5}{12}$ | | |

- (21) Waa maxay asal ma doorshaha isu qaybinta jajabyadu? $\frac{0}{16}, \frac{0}{90}, \frac{0}{200}$; ma yihiin asal ma doorshayaal?
- (22) $\frac{1}{1}, \frac{2}{2}, \frac{3}{3}, \frac{4}{4}, \dots$ mid waliba ma yahay asal ma doorshaha isku dhufashada jajabyada?

CUTUB III LABA JIBBAAR IYO XIDIDKA LABA JIBBAARKA

Marka aynu isku dhufanno 6×6 taranta aynu helno, oo ah 36, waxa loo yaqaan labajibbaarka 6. Haddaba, haddii tiro iyaduun laba jeer la isku dhufto, taranta soo baxdaa waxay tahay labajibbaarka tiradaa.

$$5 \times 5 = 25; \text{ 25 waxa weeye labajibbaarka 5.}$$

$$12 \times 12 = 144; \text{ 144 waxa weeye labajibbaarka 12.}$$

Taramaha caynkaas ah ama «labajibbaarradaa» waxa loo qori karaa :

$$5 \times 5 = 5^2 = 25; \quad 8 \times 8 = 8^2 = 64;$$

$$10 \times 10 = 10^2 = 100; \quad 12 \times 12 = 12^2 = 144;$$

$$s \times s = s^2.$$

Metelan, inoo soo qaad $8 \times 8 = 8^2$. Tirada yar ee (2) ee dusha kaga taalla 8da waxay inoo sheegeysaa inta jeer ee 8 isir ahaan loo isticmaalay. 8^2 waxay inoo tilmaamaysaa taranta, 8 lagu duftay 8. « 8^2 » waxa loo akhriyaa «siddeed labajibbaaran». Sideed u akhriyi lahayd $44^2, 9^2, 2^2$ iyo 50^2 .

Dad badan oo isticmaala labajibbaarka waxay ogaadeen inay habboon tahay inay samaystaan tuse ay ka eegtaan labajibbaarrada marka ay u baahdaan. Waxad sawiirtaa laba joog u tax. Joog u taxa hore waxad ku qortaa tirada aad doo-

neysoinaad labajibbaarto, ta labaadna waxaad ku qortaa labajibbaarka aad hesho.

TUSE LABAJIBBAARRO

| Tirooyin | Labajibbaarro |
|----------|---------------|
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |
| 4 | 16 |
| 5 | 25 |

Immika tusahaad sameysatay ayaad marka aad dooneyso in aad tiro labajibbaarkeed soo saarto isticmaali kartaa.

Layli :

Waxad soo saartaa labajibbaarrada tirooyinkan :

| | | | | | |
|-----|-----|------|----|------|-----|
| (1) | 15 | (6) | 22 | (11) | 27 |
| (2) | 40 | (7) | 34 | (12) | 31 |
| (3) | 26 | (8) | 56 | (13) | 126 |
| (4) | 121 | (9) | 73 | (14) | 112 |
| (5) | 119 | (10) | 85 | (15) | 56 |

XIDIDKA LABA JIBBAARKA

Haddii ay tiro tahay taranta laba tiro oo isle'eg, mid walba oo ka mid ah labadaa isir ee isle'eg waxa loo yaqaan xididka laba jibbaarka tiradaa. Taas waxa tusaale u ah:

$7 \times 7 = 49$; 7 waxa weeye xididka labajibbaarka 49

$9 \times 9 = 81$; 9 waxa weeye xididka labajibbaarka 81

$6 \times 6 = 36$; 6 waxa weeye xididka labajibbaarka 36

Waxa kalsoon odhan karnaa, xididka labajibbaarka 49

waa 7, xididka laba jibbaarka 36 waa 6, iyo xididka laba jibbaarka 81 waa 9. summadda xididka labajibbaarku waxa

weeye ($\sqrt{\quad}$), waxaana loogu dhawaaqaa «Xididka labajibbaarka».

SIYAABAHA LOO SOO SAARI KARO XIDIDKA LABAJIBBAARKA

1. Habka - Isiraynta.

Metelan, haddii lagu yidhaaho «soo saar xididka labajibbaarka 64», waxad ka faa'iideysan kartaa aqoonta aad u leedahay in $8 \times 8 = 64$. Markaa $\sqrt{64} = 8$. Waxa ka lood ku soo saari kartaa xididka labajibbaarka 64 in aad eegto tusihii labajibbaarrada. Joog u taxa labajibbaarrada ayaad ka eegeysaa. Tirada ku beegan ee ku taalla joogutaxa hore ayaa ah xididka labajibbaarka aad raadinaysay.

Waxa kale oo la yeeli karaa marka xididka labajibbaarka la soo saarayo, in tirada la doonayo xididka labajibbaarkeeda la raadiyo isirradeeda. Metelan, haddaan dooneyno in aynu soo saarno xididka labajibbaarka 144, waa inan horta helnaa isirada 144.

Isirrada 144 waxa loo'heli karaa in 144 horta loo qaybsho tirada mutuxan ee u yar, 2, haddana qaybta soo baxda oo ah 72 loo sii qaybsho 2. Sidaas baa loo wadayaa ilaa qaybta mar la helaa ay u qaybsami weydo 2. Markaas baa lagu eegi 3. Sidii 2 oo kale ayaa loo wadayaa. Isuqaybintaa baa la wadayaa ilaa qaybta ugu dambaysaa ay noqonayso 1. Markaa baa la isku dhufanayaa qaybiyeyaashii.

| | |
|---|-----|
| 2 | 144 |
| 2 | 72 |
| 2 | 36 |
| 2 | 18 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Markaa, isirrada 144 waxa weeye $2 \times 2 \times 2 \times 2 \times 3 \times 3$,

isirrada aynu helnay waxa loo hormo gelin karaa :

$$(2 \times 2) \times (2 \times 2) \times (3 \times 3).$$

Intaasina waxay la mid tahay $4 \times 4 \times 3 \times 3$. Tiradan dambe, marka la isticmaalo kala hormarinta isku dhufashada, waxay la mid tahay :

$$(4 \times 3) \times (4 \times 3) = 12 \times 12.$$

Waxa aynu ogaanay in $144 = 12 \times 12$. Sidaas awgeed xididka labajibbaarka 144 waa 12.

Tusaale :

Adigoo isticmaalaya isirayn waxad soo saartaa xididka labajibbaarka 576.

| | | |
|-------|---|-----|
| | 2 | 576 |
| | 2 | 288 |
| Shaqo | 2 | 144 |
| | 2 | 72 |
| | 2 | 36 |
| | 2 | 18 |
| | 3 | 9 |
| | 3 | 3 |
| | 1 | 1 |

$$\begin{aligned} 576 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \\ &= (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (3 \times 3) \\ &= 8 \times 8 \times 3 \times 3 = (8 \times 3) \times (8 \times 3) = 24 \times 24 \end{aligned}$$

Xididka labajibbaarka 576 waa 24.

Layli :

1. Waa maxay qiimaha :

- | | |
|------------------|------------------|
| (1) $\sqrt{25}$ | (2) $\sqrt{36}$ |
| (3) $\sqrt{100}$ | (4) $\sqrt{49}$ |
| (5) $\sqrt{1}$ | (6) $\sqrt{b^2}$ |

2. Kol haddii $6^2 = 36$, $7^2 = 49$, $\sqrt{40}$ waa in u ka weynaadaa Kana yaraadaa

3. $\sqrt{29}$ wuxuu u dhexeeyaa iyo

4. $\sqrt{85}$ ka weyn kana yar

6. Soo saar xididka labajibbaarka tirooyinkan, adigoo isticmaalaya isirayn :

- | | | | |
|---------|-----------|---------|----------|
| (1) 484 | (2) 324 | (3) 400 | (4) 1600 |
| (5) 169 | (6) 196 | (7) 441 | (8) 729 |
| (9) 189 | (10) 256. | | |

2. Habka Qaybiska iyo Celcelinta.

Ilaa iyo hadda, isireyn baynu ku soo saari jirney xididka labajibbaarka. Waxaad ogsoon tahay markaynu raadinaynay xididka labajibbaarka 16, 25, 81, 625 iyo wixii la mid ah inaynu isirrada tirada dooni jirnay sida :

$$\begin{aligned} 16 &= 4 \times 4 = 4^2 & 25 &= 5 \times 5 = 5^2 \\ 81 &= 9 \times 9 = 9^2 & 625 &= 5 \times 5 \times 5 \times 5 = 5^4 \end{aligned}$$

Dabadeedna aynu odhan jirnay $\sqrt{16} = 4$, $\sqrt{25} = 5$

$\sqrt{81} = 9$, $\sqrt{625} = 25$ iyadoo summadda « $\sqrt{\quad}$ »

ay u taagan tahay xididka ka weyn eber. Tirooyinka aynu xididdada labajibbaarka u soo saari karayney ilaa iyo hadda waxay wada ahaayeen kuwo labajibbaaran. Waxa isweyddiin leh. «Sideebaa xididka labajibbaarka loo soo saari karaa hadaanay tiradu labajibbaarreyn?» Si aynu uga jawaabno arrintaa waxaynu raaci karnaa jidkan.

Ka soo qaad in aynu doonayno xididka labajibbaarka 324. Tolow 14, 15, 16, miyaa mise waa wax kale? Bal ka dhig inay jawaabtu tahay 14. Bal 324 aynu u qaybino 14.

$$\begin{array}{r}
 23.14 \\
 14 \overline{) 324} \\
 \underline{28} \\
 44 \\
 \underline{42} \\
 20 \\
 \underline{14} \\
 60 \\
 \underline{56} \\
 4
 \end{array}$$

Haddii jawaabtu ay hagaagsan tahay waa inay is le'ekaa-
daan qaybshaha (14) iyo qaybtu (23.14). Waad aragtaa
ineyna qaybshaha iyo qaybtu is le'ekayn. Si aynu ku helno
jawaab u dhow jawaabta hagaagsan, waxaynu bilaabeynaa
qaybis cusub.

$$\frac{14 + 23.14}{2} = \frac{37.14}{2} = 18.57$$

$$\begin{array}{r}
 17.44 \\
 18.57 \overline{) 324} \\
 \underline{1857} \\
 1383 \\
 \underline{12999} \\
 8310 \\
 \underline{7428} \\
 8820 \\
 \underline{7428} \\
 1392
 \end{array}$$

$$\frac{18.57 + 17.44}{2} = \frac{36.01}{2} = 18.005$$

Haddii immika aynu qaadanno 18, waxaad arkaysaa in

$$\begin{array}{r}
 18 \\
 18 \overline{) 324} \\
 \underline{18} \\
 144 \\
 \underline{144} \\
 00
 \end{array}$$

Immika qaybshaha iyo qaybtu way is le'egyihin. Kolkaa
xididka labajibbaarka $324 = 18$, waayo

$$18 \times 18 = 324$$

Ka dhig immika inaynu doonayno xididka labajibbaarka
961. Ku qiyaas inay tahay 10. (Ogeysiis: tiradaad doon-
tid ayaad qiyaas u qaadan kartaa, waxase fiican midba mid-
kuu uga dhow yahay jawaabta).

$$\begin{array}{r}
 96.1 \\
 10 \overline{) 961} \\
 \underline{90} \\
 61 \\
 \underline{60} \\
 10 \\
 \underline{10} \\
 00
 \end{array}$$

$$\frac{10 + 96.1}{2} = \frac{106.1}{2} = 53.05$$

$$\begin{array}{r}
 53.05 \quad | \quad 18.1 \\
 \hline
 961 \\
 5305 \\
 \hline
 43050 \\
 42440 \\
 \hline
 6100 \\
 5305 \\
 \hline
 795
 \end{array}$$

$$\frac{53.05 + 18.1}{2} = \frac{71.15}{2} = 35.56$$

$$\begin{array}{r}
 35.56 \quad | \quad 27.02 \\
 \hline
 961 \\
 7112 \\
 \hline
 24980 \\
 24892 \\
 \hline
 8800 \\
 7112 \\
 \hline
 1688
 \end{array}$$

$$\frac{35.56 + 27.02}{2} = \frac{62.58}{2} = 31.29$$

$$\begin{array}{r}
 31.29 \quad | \quad 30.71 \\
 \hline
 961 \\
 9387 \\
 \hline
 22300 \\
 21903 \\
 \hline
 3970 \\
 3129 \\
 \hline
 841
 \end{array}$$

$$\frac{31.29 + 30.71}{2} = \frac{61.00}{2} = 30.5$$

Haddii aad 31 qaybshe u qaadatid waxaad arkaysaa in:

$$\begin{array}{r}
 31 \\
 31 \quad | \quad 961 \\
 \hline
 93 \\
 \hline
 31 \\
 31 \\
 \hline
 00
 \end{array}$$

Kolka xididka labajibbaarka $961 = 31$.

Shaqada badani waxay ku tusaysaa qiyaasteennu inay xumayd. Waad ogtahay in $30 \times 30 = 900$. Kolka haddii qiyaas aynu ka dhigno 30, shaqadu way inoo hawl yaraan lahayd.

$$\begin{array}{r}
 30 \quad \overline{) 32.03} \\
 \underline{961} \\
 90 \\
 \underline{61} \\
 60 \\
 \underline{100} \\
 90 \\
 \underline{10}
 \end{array}$$

$$\frac{30 + 32.03}{2} = \frac{62.03}{2} = 31.015$$

$$\begin{array}{r}
 31 \quad \overline{) 961} \\
 \underline{961} \\
 00
 \end{array}$$

Tusaale kale :

Soo saar xididka labajibbaarka 134.56. Waxaynu ognahay in $11 \times 11 = 121$. Kolka aan ku bilawno 11.

$$\begin{array}{r}
 11 \quad \overline{) 134.56} \\
 \underline{11} \\
 24 \\
 \underline{22} \\
 25 \\
 \underline{22} \\
 36 \\
 \underline{33} \\
 3
 \end{array}$$

$$\frac{11 + 12.23}{2} = \frac{23.23}{2} = 11.62$$

$$\begin{array}{r}
 11.62 \quad \overline{) 134.56} \\
 \underline{1162} \\
 1836 \\
 \underline{1162} \\
 6740 \\
 \underline{5810} \\
 9300 \\
 \underline{9296} \\
 4
 \end{array}$$

$$\frac{11.62 + 11.58}{2} = \frac{23.20}{2} = 11.60$$

$$\begin{array}{r}
 11.6 \\
 11.6 \overline{) 134.56} \\
 \underline{116} \\
 185 \\
 \underline{116} \\
 696 \\
 \underline{696} \\
 000
 \end{array}$$

Kolkaa xididka labajibbaarka $134.56 = 11.6$.

Layli :

Adoo raacaya habka qaybiska iyo celcelinta, waxaad soo saartaa xididka labajibbaarka :

- (b) 529 (t) 6084 (j) 729
 (x) 9.61 (kh) 116.64 (d) 14641
 (r) 17.89 (s) 6.8644 (sh) 15227.56

Tusaalooyinka iyo layligaasiba waxay wada ahaayeen labajibbaarro : Habka qaybiska iyo celcelinta waa lagu isticmaali karaa kuwa aan labajibbaarro ahayn.

Tusaale :

Soo saar xididka labajibbaarka 72.

Furfurid :

Haddii aynu ku bilowno 8, waxaad heleysaa :

$$\begin{array}{r}
 9 \\
 8 \overline{) 72} \\
 \underline{72} \\
 00
 \end{array}$$

$$\frac{8 + 9}{2} = 8.5$$

$$\begin{array}{r}
 8.47 \\
 8.5 \overline{) 72.0} \\
 \underline{68.0} \\
 400 \\
 \underline{340} \\
 600 \\
 \underline{595} \\
 5
 \end{array}$$

$$\frac{8.5 + 8.47}{2} = 8.485$$

Kolkaa god gudh ah haddaad ka dhigtid, xididka labajibbaarka 72 waa 8.5.

Tusaale kale :

Soo saar xididka labajibbaarka 178 adoo jawaabta isugu soo celinaya laba god oo ah jajab tobanle.

Furfurid :

Waxaad ogtahay in $13^2 = 169$. Marka aan ku bilowno 13.

$$\begin{array}{r}
 13.69 \\
 13 \overline{) 178} \\
 \underline{13} \\
 48 \\
 \underline{39} \\
 90 \\
 \underline{78} \\
 120 \\
 \underline{117} \\
 3
 \end{array}$$

$$\frac{13 + 13.69}{2} = \frac{26.69}{2} = 13.345$$

13.338

13.345 | 178
 13345

44550
 40035

45150
 40035

51150
 40035

111150
 106760

4390

$$\frac{13.345 + 13.338}{2} = \frac{26.683}{2} = 13.342$$

13.3413

13.342 | 178
 13342

44580
 40026

45540
 40026

55140
 53368

17720
 13342

43780
 40026

3754

Kolka, xididka labajibbaarka 178 waa 13.34 iyadoo laysugu soo celiyey laba god oo ah jajab tobanle.

Layli :

Adoo raacaya habka qaybiska iyo celcelinta, waxaad soo saartaa xididka labajibbaarka :

- | | | | | | |
|--------|--------|--------|-------|---------|-------|
| (i) | 22.2 | (ii) | 333 | (iii) | 3.33 |
| (iv) | 126.72 | (v) | 353.4 | (vi) | 32.64 |

3. Habka qaybiska Dheer.

Marka aynu raadinayno xididka labajibbaarka ilaa iyo hadda waxaynu aragnay laba jid oo la raaco. Jidka hore oo ahaa isireynta iyo ka labaad oo ahaa habka qaybiska iyo celcelinta waan soo aragnay. Iminka waxaynu bilaabaynaa jid cusub oo la yidhaado : habka qaybiska dheer. Si aad ku garato jidka cusub waxa aad ugu fiirsataa tusaalooyinka kala jaadjaadka ah ee hoos ku dhigan

Tusaale :

Soo saar xididka labajibbaarka: (i) 59 (ii) 838.

Furfurid :

| | | | |
|-----|---------------|------|----------------|
| (i) | 7.681 | (ii) | 28.948 |
| | 7 $\sqrt{59}$ | | 2 $\sqrt{838}$ |
| | 49 | | 4 |
| | 146 | | 48 |
| | 876 | | 438 |
| | | | 384 |
| | 1528 | | 569 |
| | 12400 | | 5400 |
| | 12224 | | 5121 |
| | 15361 | | 5784 |
| | 17600 | | 27900 |
| | 15361 | | 23136 |
| | 2239 | | 57888 |
| | | | 476400 |
| | | | 463104 |
| | | | 13296 |

Kolka xididka labajibbaarka 59 waa 7.68 ka 838-na waa 28.95 haddii aad isugu soo celisid laba god oo jajab tobanle ah.

1. Marka aad haysatid tiro aan ahayn jajab tobanle, midig ka soo bilow oo laba laba god isugu qaad.
2. Waxaad u qaybisa tirada ugu weyn ee labajibbaarkeedu aanu dhaafsiisneyn tirada bidix ugu xigta markaad laba laba god isugu qaaddid tiradaad haysatey.
3. Laba god soo deji; haddii godad aanay ku hadhin laba eber soo deji.
4. Labanlaab (7×2 ta hore, 2×2 tusaalaha labaad).
5. Qaybtii aad labanlaabtay xagga midig waxaad kaga darta qaybta cusub.
6. Tallaabooyinka sare sii wad ilaa aad gaadhid inta god ee-la rabo.

Tusaale : Soo saar xididka labajibbaarka 5348 :

$$\begin{array}{r}
 73.130 \\
 7 \sqrt{53,48} \\
 \underline{49} \\
 143 \quad 448 \\
 \quad \quad 429 \\
 \hline
 1461. \quad 1900 \\
 \quad \quad 1461 \\
 \hline
 14623 \quad 43900 \\
 \quad \quad 43869 \\
 \hline
 31 \quad 1003100 \\
 \quad \quad 877596 \\
 \hline
 \end{array}$$

Kolkaa xididka labajibbaarka 5348 waa 73.130 iyadoo saddex god oo ah jajab tobanle laysugu celiyey.

Tusaale : Soo saar xididka labajibbaarka 1303.

Furfuris :

$$\begin{array}{r}
 36.097 \\
 3 \sqrt{13,03} \\
 \underline{9} \\
 66 \quad 403 \\
 \quad \quad 396 \\
 \hline
 720 \quad 700 \\
 7209 \quad 70000 \\
 \quad \quad 64881 \\
 \hline
 72187 \quad 511900 \\
 \quad \quad 505309 \\
 \hline
 6591
 \end{array}$$

Xididka labajibbaarka 1303 iyadoo saddex god oo jajab tobanle loo celiyey waa 36.097.

Layli :

Tirooyinka hoos ku yaalla, soo saar xididka labajibbaar-kooda. Haddii aanay tiradaasi ahayn mid labajibbaaran, jawaabta waxaad ku soo saarta laba god oo jajab tobanle.

| | | | | | | | |
|------|------|------|-------|------|------|------|-------|
| (1) | 529 | (2) | 17965 | (3) | 585 | (4) | 3434 |
| (5) | 696 | (6) | 12348 | (7) | 1529 | (8) | 14740 |
| (9) | 4356 | (10) | 52900 | (11) | 7777 | (12) | 1035 |
| (13) | 1699 | (14) | 939 | (15) | 265 | (16) | 11345 |

Casharka hore wuxuu ina tusay sida loo soo saaro xididka labajibbaarka kolka aad haysatid tiro aanu ku jirin jajab tobanle. Haddaba, aan isweyddiinno sidii loo soo saari lahaa

xididka labajibbaarka marka tirada uu ku jiro jajab tobanle. Run ahaanti sidii loo soo saari lahaa xididka labajibbaarka waxba caynkaasa kama duwana kii hore. Waxase hadda loo baahan yahay inaynu jajabka tobanle laba u sii kala qaadno.

4. Tiro ay barta jajab tobanle dhexda ku jirto

(sida : 15.34)

Kolkan, markii aad dooneysid inaad soo saartid xididka labajibbaarka tallaabooyinkii hore aynu u soo sheegnay waxa isbeddelaya tallaabada ugu horreysey. Hadda waxaad ka bilaabaysaa rugta jajabka tobanle (barta). Kolkaasaad u soconaysaa laba laba god xagga midig iyo xagga bidix. Tallaabooyinkii kale sidoodii bay ahaanayaan.

Tusaale : Soo saar xididka labajibbaarka (i) 9.371 iyo

(ii) 15.34.

Furfurid :

$$(i) \quad \begin{array}{r} 3 \sqrt{9.371} \\ \underline{9} \\ 60 \quad 3710 \\ 606 \quad 3636 \\ \underline{\quad} \\ \quad 74 \end{array}$$

$$\therefore \sqrt{9.37} = 3.06$$

$$(ii) \quad \begin{array}{r} 3 \sqrt{15.34} \\ \underline{9} \\ 69 \quad 634 \\ \quad 621 \\ \underline{\quad} \\ 781 \quad 1300 \\ \quad 781 \\ \underline{\quad} \\ 7826 \quad 51900 \\ 78326 \quad 46956 \\ \underline{\quad} \\ \quad 494400 \\ \quad 469956 \\ \underline{\quad} \\ \quad 24444 \end{array}$$

$$\therefore \sqrt{15.34} = 3.917$$

Tusaale : Soo saar xididka labajibbaarka 253.562.

$$\begin{array}{r} 15.92 \\ 1 \sqrt{253.562} \\ \underline{1} \\ 309 \quad 153 \\ \quad 125 \\ \underline{\quad} \\ 3182 \quad 2856 \\ \quad 2781 \\ \underline{\quad} \\ \quad 7520 \\ \quad 6364 \\ \underline{\quad} \\ \quad 1156 \end{array}$$

$$\therefore \sqrt{253.562} = 15.92$$

5. Tiro ay barta jajab tobanle ugu horayso.

(sida : 0.537).

Markan waxaad ka bilaabaysaa rugta jajab tobanle (barta) waxaanaad u qaadaysaa laba laba god.

Tusaale : Soo saar xididka labajibbaarka 0.537.

$$\begin{array}{r}
 0.733 \\
 7 \sqrt{0.53,7} \\
 \underline{49} \\
 143 \quad 470 \\
 \underline{429} \\
 1463 \quad 4100 \\
 \underline{4389}
 \end{array}$$

$$\therefore \sqrt{0.537} = 0.733$$

Tusaale : Raadi xididka labajibbaarka 0.1369.

Furfurid :

$$\begin{array}{r}
 0.37 \\
 3 \sqrt{0.13,69} \\
 \underline{9} \\
 67 \quad 469 \\
 \underline{469} \\
 000
 \end{array}$$

$$\therefore \sqrt{0.1369} = 0.37$$

Tusaale : Raadi xididka labajibbaarka 0.03452.

Furfurid :

$$\begin{array}{r}
 0.186 \\
 1 \sqrt{0.03,45,2} \\
 \underline{1} \\
 28 \quad 245 \\
 366 \quad 224 \\
 \quad 2120 \\
 \quad 2196
 \end{array}$$

$$\therefore \sqrt{0.03452} = 0.186$$

Ogeysiis : Mar haddii tirada aad haysataa ay tahay jajab tobane, jawaabtaaduna waxay noqanaysaa jajab tobanle.

Layli :

Raadi xididka labajibbaarka tirooyinka hoos ku yaal :

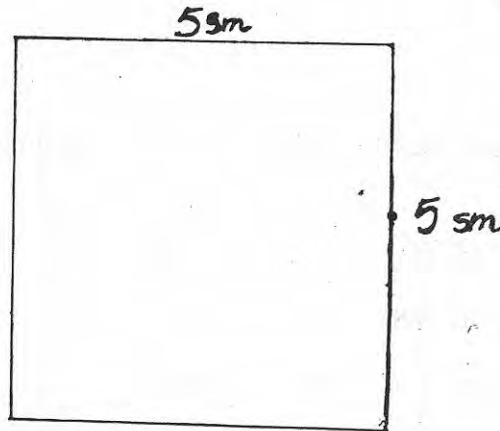
| | | | | | |
|-----|----------|-----|-----------|-----|----------|
| 1. | 8.38 | 2. | 33.475 | 3. | 444.687 |
| 4. | 0.598 | 5. | 0.1347 | 6. | 0.094783 |
| 7. | 3397.3 | 8. | 0.0064 | 9. | 10.9561 |
| 10. | 9135.622 | 11. | 0.9135622 | 12. | 4030.5 |
| 13. | 0.3261 | 14. | 2631.69 | 15. | 0.285 |

BED IYO WAREEG

Q E E X O

b. Labajibbaarane.

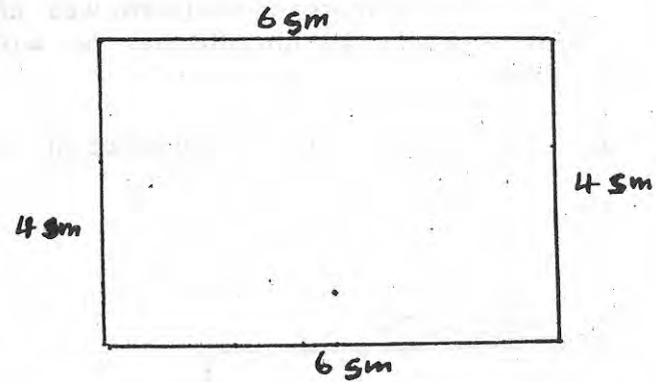
Labajibbaaranuhu waa shaxan afar dhinac oo isle'eg iyo afar xaglood oo qumman leh. Jaantuska hoos ku yaallaa waa labajibbaarane dhinac kastaa 5 sm. yahay.



t. Laydi.

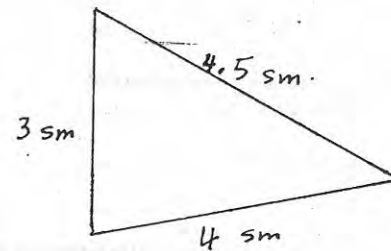
Laydigu, waa shaxan afar dhinac leh oo labadii dhinac ee iska soo horjeedaaba ay isle'eg yihiin, barbarrana yihiin, oo weliba afartiisa xaglood ay qumman yihiin. Jaantuska hoose

waa laydi dhererkiisu yahay 6 sm., ballaciisuna yahay 4 sm.



J. Saddexagal.

Saddexagalku, waa shaxan saddex dhinac leh. Jaantuska hoose waa saddexagal cabbirka dhinacyadiisu ay yihiin 3 sm., 4 sm. iyo 4.5 sm.



WAREEGGA

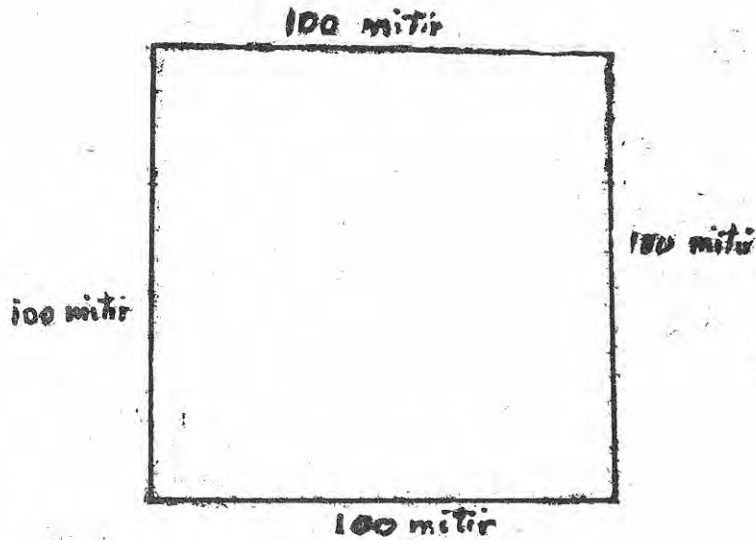
b. Labajibbaarane.

Cali iyo walaalkii baa doonay inay ijaar (deyr) taar ah u soo iibsadaan beertooda. Beertu waa labajibbaarane dhinac kastiba 100 mitir yahay. Cali baa yidhi, «Afar boqol oo mitir baan u baahannahay». Walaalkii wuxu yidhi, «Sidec

ku ogaatay inay afar boqol oo mitir inagu filnaanayso?».

Cali wuxu ugu jawaabey, «Boqol mitir iyo boqol mitir iyo boqol mitir iyo boqol mitir marka la isku daro waa afar boqol oo mitir. Walaalkii way ka dhaadhacday oo wuxu yidhi, «Walaal, waa runtaa».

Jaantuska hoos ku yaallaa wuxu muujinayaabeertii Cali iyo waalalkii.

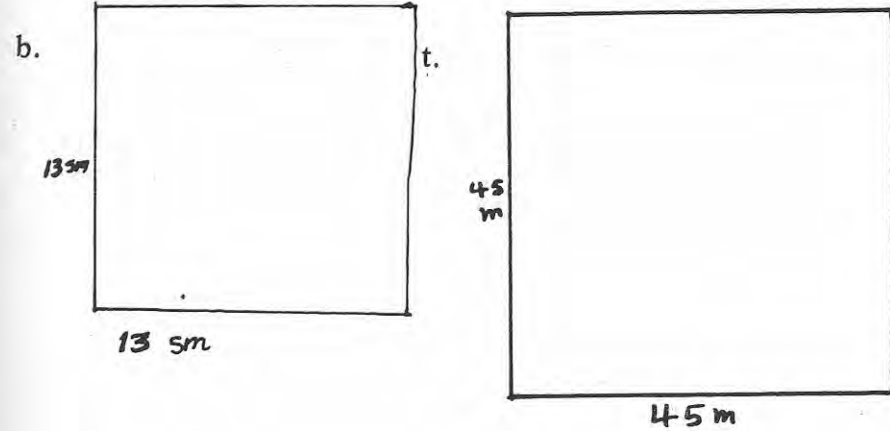


Cali iyo walaalkii waxay soo saareen wareegii beertooda.

Wareegga labajibbaaranaha waxa lagu soo saari karaa isugeyn fa isugeeyo dhererrada dhinacyadiisa.

Wareegga shaxan kasta oo oodani waxa weeye wadarta dhererrada xarriiqyada ay ku dhex oodan tahay.

Tusaale : Soo saar wareegga labajibbaaranaha hoos ku yaal.



Furfurid :

Haddii la ina siiyo dhererka dhinac qudha oo labajibbaaranaha, waan soo saari karnaa wareeggiisa waayo waxan ognahay inay dhinacyadiisu isle'eg yihiin.

Wareegga labajibbaaranaha hore waa :

$$13 \text{ sm.} + 13 \text{ sm.} + 13 \text{ sm.} + 13 \text{ sm.} = 52 \text{ sm.}$$

Labajibbaaranaha kalana wareeggiisu waa :

$$45 \text{ m.} + 45 \text{ m.} + 45 \text{ m.} + 45 \text{ m.} = 180 \text{ m.}$$

Layli :

1. Waa maxay labajibbaaranuhu?
2. Sidee lagu soo saaraa wareegga labajibbaaranaha?
3. Taswiir labajibbaaranaha dhinac kastiba yahay :
(b) 7 sm. (t) 5 sm. (j) 2.5 sm.
4. Ma aragtay wax labajibbaaranaha u eg?
Waa maxay?
5. Soo saar wareegga labajibbaaranadan, dhererka dhinacyadooda lagu siiyey.

(b) 8 sm. (t) 40 mitir (j) 12.5 km.

(x) 84 hiish.

t) **Jidka Wareegga labajibbaarane.**

Tusaalihii hore, waxad ka ogaatey haddii dhererka dhinac labajibbaarane lagu sheego. Inaad soo saari karayso wareegiisa.

Waxaan nidhi wareegii labajibbaaranihii hore waa :

$$13 \text{ sm.} + 13 \text{ sm.} + 13 \text{ sm.} + 13 \text{ sm.} = 52 \text{ sm.}$$

Laakiin

$$13 \text{ sm.} + 13 \text{ sm.} + 13 \text{ sm.} + 13 \text{ sm.} = 4 \times 13 \text{ sm.} = 52 \text{ sm.}$$

Sidaas oo kale, wareegii labajibbaaranihii danbe waa :

$$45 \text{ m.} + 45 \text{ m.} + 45 \text{ m.} + 45 \text{ m.} = 4 \times 45 \text{ m.} = 180 \text{ m.}$$

Hadda, waxan arkaynaa, haddii la inoo sheego dhererka dhinac labajibbaarane, in wareeggiisu yahay taranta 4 iyo dhererka dhinacaa.

Weedhaa waxan u qori karnaa $W = 4 \times dh.$

Wareegga labajibbaarane waa taranta 4 iyo dhererka dhinaciisa.

Layli :

1. Sheeg jidka wareegga labajibbaarane.
2. Raadi wareegga labajibbaaranada dhererka dhinac-yadooda lagu siiyey.

(b) 20 sm. (i) 2 sm. (j) 25 sm.

(x) 2 sm. (k) 2 sm. (d) 13 km.

(r) 7.5 waar (s) $7 \frac{1}{4}$ mm. (sh) $18 \frac{1}{16}$ fdh.

(dh) 21.7 mayl (c) 15.5 sm. (g) 2.2 hiish.

j) **Dhinaca labajibbaarane, markaad wareeggiisa haysato.**

Tusaale :

Raadi dherer dhinac labajibbaarane uwareeggiisu yahay 56 sm.

Furfurid :

Wareegga labajibbaarane jidkan iyaa inna siiya

$$W = 4 \times dh.$$

Markan $56 \text{ sm.} = 4 \times \text{--- sm.}$

ku qor xarriijinta dusheeda tirada marka 4 lagu dhufto inna siisa 56. Waa taqaan in isku dhufashada iyo isu-qaybintu ay isweydaar yihiin ogaan odhan karno :

$$\frac{56 \text{ sm.}}{4} = \text{--- sm. ama } 14 \text{ sm.}$$

Haddaan dhigno dh halkii xarriijinta, waxan heleynaa

$$56 \text{ sm.} = 4 \times dh. \text{ iyo } \frac{56 \text{ sm.}}{4} = dh.$$

ama $14 \text{ sm.} = dh.$

Waxan ognahay in dh u taagan tahay dhererka dhinaca labajibbaaranaha. Tusaalahan, dhererka dhinaca labajibbaaranihii wareeggiisa la ina siiyey waa 14 sm.

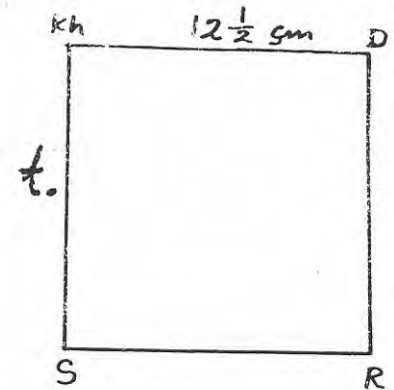
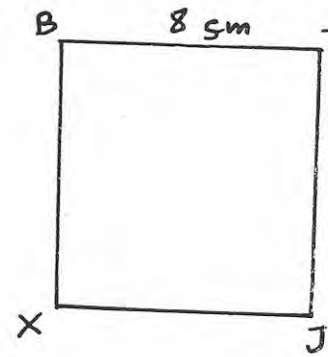
Haddaba, marka la garanayo wareegga labajibbaaranaha

jidkan baa lagu heli karaa dhererka dhinaciisa : $dh. = \frac{W}{4}$.

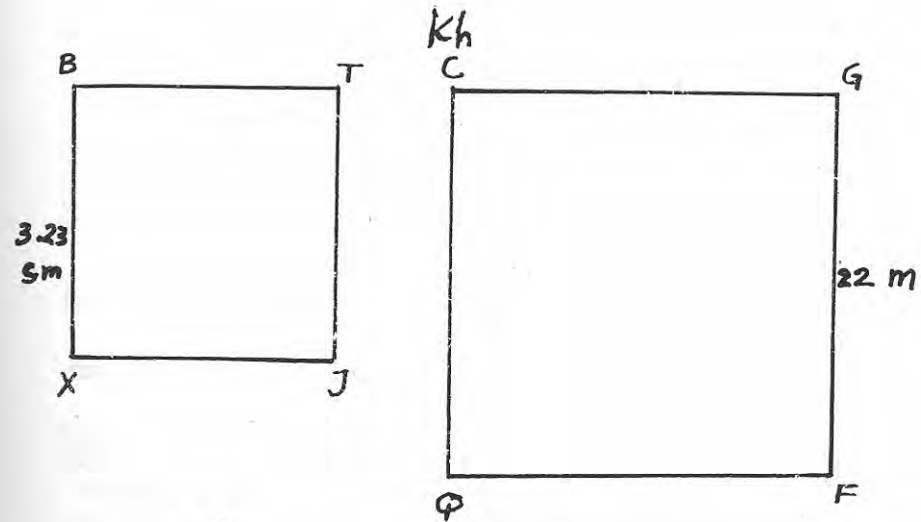
Layli :

1. Raadi dhererrada dhinacyada labajibbaarannada wareegooda lagu siiyey :
 (b) $W = 75 \text{ sm.}$ (t) $W = 272 \text{ mm.}$ (j) 15 fdh.
 (x) 64 mayl (d) 28 waar (r) 45 km.
 (s) 12.4 sm. (sh) 28.2 dm. (dh) 12.04 hiish
 (c) 1 sm.
2. Raadi wareegga labajibbaarana dhererka dhinaciisu yahay $12 \frac{1}{4} \text{ sm.}$
3. Labajibbaarane wareeggiisu yahay 50 sm., soo saar dhererka dhinaciisa.
4. Qor jidka wareegga labajibbaarane marka dhinaciisa lagu siiyo.
5. Sheeg jid lagu soo saari karo dhererka dhinac labajibbaarane haddii wareeggiisa lagu siiyo.
6. Soo saar wareegyada labajibbaarannada hoos ku sawiran.

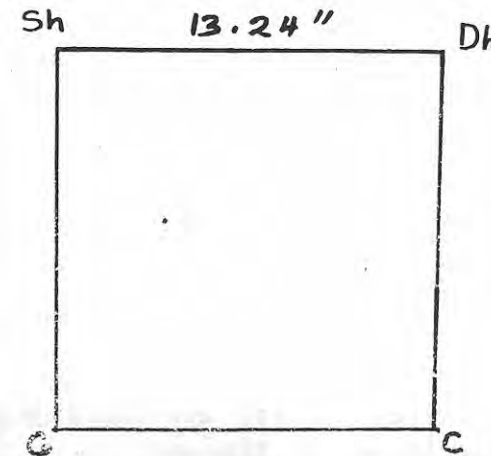
3.



b.



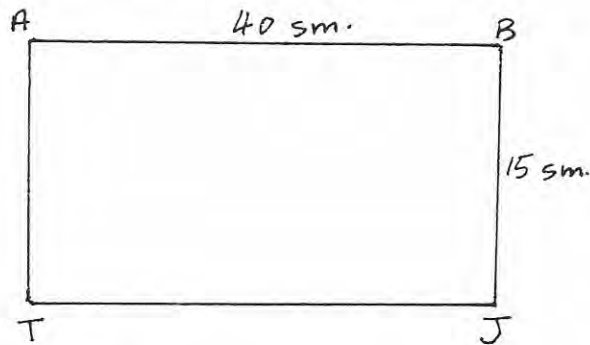
G.



L A Y D I G A

Ha illoobin labada dhinac ee iska soo horjeeda ee laydigu in ay isle'eg yihiin, barbarrana yihiin, oo ay afartiisa xagloodna qumman yihiin.

Haddii dhinaca AB ee laydiga hoos ku sawiran u cabbirkiisu yahay 40 sm., dhinaca TJ cabbirkiisu waa 40 sm., waayo TJ waa dhinac ka soo horjeeda AB.



Haddii dhinaca BJ u cabbirkiisu yahay 15 sm., waa imisa cabbirka AJ?

Dhinaca dheer ee laydiga waxa la yidhaa **dherer**, dhinaca gaabanna waxa la yiraa **ballac**, dherer marka la gaabinayo, waxa loo qoraa «l», ballacna «b». Laydiga kor ku sawiran wareeggiisu waa wadarta cabbiraadda dhinacyadiisa, oo ah 40 sm. + 15 sm. + 40 sm. + 15 sm. = 110 sm. Wareeggiisu waa 110 sm. Kol haddii biirooyinka sidii la doono loo ururin karo, wareegga laydiga waxan ku heli karnaa sidan soo socota.

$$40 \text{ sm.} + 15 \text{ sm.} + 40 \text{ sm.} + 15 \text{ sm.} = 110 \text{ sm.}$$

Kol haddii ay isugeyntu hormogal tahay waxa loo qori karaa isle'egtan hore

$$(40 + 15) \text{ sm.} + (40 + 15) \text{ sm.} = 110 \text{ sm.}$$

intaasina waxay u dhigantaa

$$2 \times (40 + 15) \text{ sm.} = 110 \text{ sm.}, \text{ oo u dhiganta}$$

$$2 \times 55 \text{ sm.} = 110 \text{ sm.}$$

x) Jidka wareegga Laydi.

Haddii laydi dhererkiisu yahay 40 sm., ballaciisuna yahay 15 sm., isle'egta $2 \times (40 + 15) \text{ sm.} = 110 \text{ sm.}$ waxan ku heleynaa, sidaan horeba u aragnay, wareegga laydigaa. «Wareegga laydigu wuxu le'eg yahay wadarta dhererka iyo ballaca oo la labanlaabay».

Haddii «W» ay u taagan tahay wareegga, «l» ay u taagan tahay dhererka, «b» ay u taagan tahay ballaca, weedha sare waxan u dhigi karnaa sidan :

$$W = 2 \times (l + b)$$

Wareeggu waa wadarta cabbiraadda dhinacyada oo la isugeeyey. Markaas, waxa loo baahan yahay in halbeegyada cabbiraadahaasi ay isku jaad noqdaan.

Tusaale :

Raadi wareegga laydi dhererkiisu yahay 2 mitir, ballaciisuna yahay 60 sm.

Furfurid :

U beddel labada mitir sentimitiro, ku shaqeena jidkii wareegga laydiga :

$$\begin{aligned} W &= 2 \times (l + b) \\ &= 2 \times (200 \text{ sm.} + 60 \text{ sm.}) \\ &= 2 \times 260 \text{ sm.} \\ &= 520 \text{ sm.} \end{aligned}$$

Wareeggu waa 520 sm.

Layli :

1. Sheeg jidka lagu helo wareegga laydiga.
2. Raadi wareegyada laydiyada lagu siiyey dhererkooda iyo ballacooda.

| Dherer | Ballac | Wareeg |
|----------|--------|---------|
| b) 7 sm. | 3 sm. | = ----- |

- t) $\frac{1}{4}$ m. 20 sm. = -----
- j) 1.2 m. 80 sm. = -----
- x) 33 sm. 25 sm. = -----
- kh) 1 km. 39 m. = -----
- d) 4 m. 2 m. = -----
- r) 3 dm. 2 dm. = -----
- s) 13 hiish $\frac{1}{2}$ fdh. = -----
- sh) 1 waar 2.5 fdh. = -----
- dh) 1.5 m. 95 sm. = -----

3. Raadi wareegga qolka aad ku jirto.
4. Raadi wareegga miiska baraha.
5. Raadi wareegga wajiga ballaaran ee buugga xisaabta.

kh) Dhererka iyo ballaca laydi marka wareegga la yaqaan.

Tusaale :

Raadi dhererka laydi wareeggiisu yahay 60 sm., ballaciisuna yahay 13 sm.

Waxaan naqaan in $W = 2 \times (1 + b)$

Markaa $\frac{W}{2} = 1 + b$ Sidaa daraadeed

$$\frac{W}{2} - b = 1$$

Haddaba $\frac{60}{2}$ sm. - 13 sm. = 1

$$30 \text{ sm.} - 13 \text{ sm.} = 17$$

$$17 \text{ sm.} = 17$$

Dhererka laydigani waa 17 sm.

Tusaale :

Raadi ballaca laydiga wareeggiisu yahay 86 m., dhererkiisuna yahay 35 m.

$$W = 2(1 + b)$$

$$\frac{W}{2} = 1 + b$$

$$\frac{W}{2} - 1 = b$$

Haddaba $\frac{86 \text{ m.}}{2} - 35 \text{ m.} = b$

$$43 \text{ m.} - 35 \text{ m.} = 8 \text{ m.} = b$$

Ballaciisu waa 8 m.

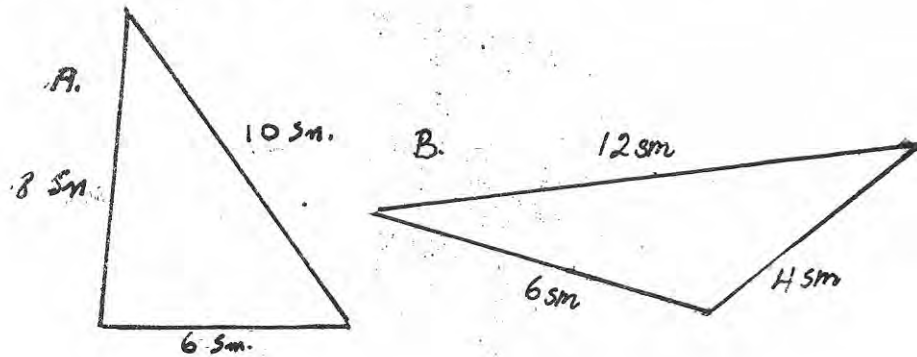
Layli :

1. Sheeg jidka lagu helo dhererka laydiga haddii la yaqaan wareeggiisa iyo ballaciisa.
2. Waa maxay jidka lagu helo ballaca laydiga marka la yaqaan dhererka iyo wareegga?
3. Raadi dhererrada laydiyada wareegyadooda iyo ballacyadooda hoos lagugu siiyey :

| | Wareeg | Ballac |
|----|---------|--------|
| b) | 20 sm. | 7 sm. |
| t) | 214 sm. | 55 sm. |

- j) 11.4 hiish 4.7 hiish
 x) 25 fdh. 6.5 fdh.
 kh) 124 mm. 0.50 mm.

d) Wareegga saddexagal.



Wareegga saddexagalka A ee kor ku taswiirani waa wadarta cabbirka dhinacyadiisa.

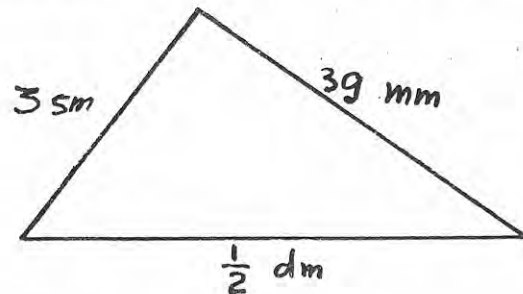
$$W = 8 \text{ sm.} + 10 \text{ sm.} + 6 \text{ sm.} = 24 \text{ sm.}$$

Waa immisa milimitir wareegga saddexagalka B ee kor ku taswiirani?

Saddexagal kasta wareeggiisu waa wadarta cabbirka dhinacyadiisa.

Tusaale :

Raadi wareegga saddexagalka hoos ku taswiiran :



Halbeegyada cabbiraadda dhinacyada saddexagalkani way kala geddisan yihiin. Markaa, milimitirro aan u wada beddelno ama sentimitirro ama desimitiroba.

$$3 \text{ sm.} = 30 \text{ mm.}, \quad \frac{1}{2} \text{ dm.} = 5 \text{ sm.} = 50 \text{ mm.}$$

$$W = 3 \text{ sm.} + 39 \text{ mm.} + \frac{1}{2} \text{ dm.}$$

$$= 30 \text{ mm.} + 39 \text{ mm.} + 50 \text{ mm.} = 119 \text{ mm.}$$

Layli :

1. Sidee lagu helaa wareegga saddexagal?
2. Waa maxay saddexagal?
3. Wax saddexagal u eg ma taqaan? Muxuu yahay?
4. Raadi wareegyada saddexagallada dhererka dhinacyadooda lagu siiyey :

b) 6 sm. 14 sm. 12 sm.

t) 30 m. 25 m. 12 m.

j) $3\frac{1}{2}$ sm. $5\frac{1}{4}$ sm. $6\frac{1}{4}$ sm.

x) 17.8 mm. 8.9 mm. 14.5 mm.

kh) 1.53 fdh. 2.6 fdh. 3.72 fdh.

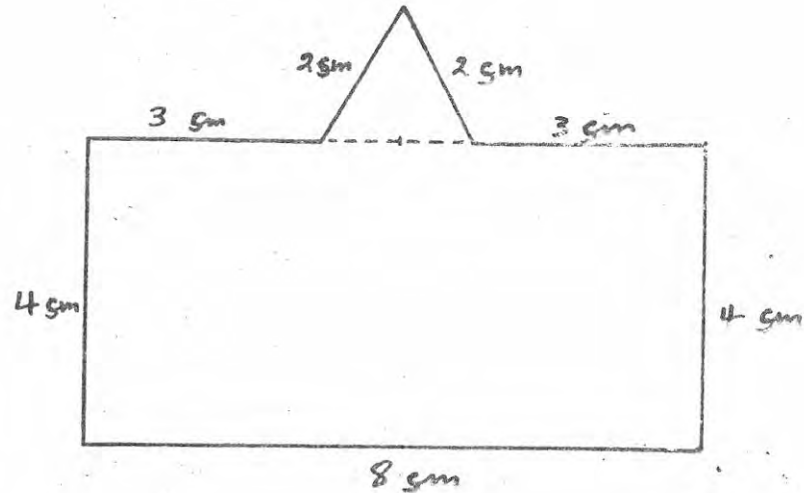
d) 3 sm. 22 m. 2 dm.

r) 0.5 m. 35 sm. 2.7 dm.

s) 3 fdh. 9 hiish 1 waar

sh) 17 mm. 18 mm. 9 mm.

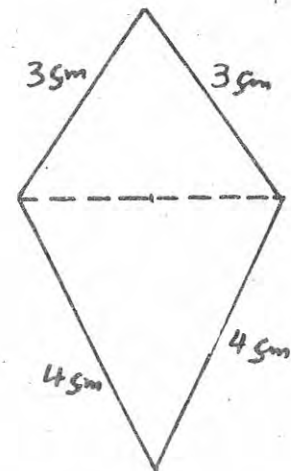
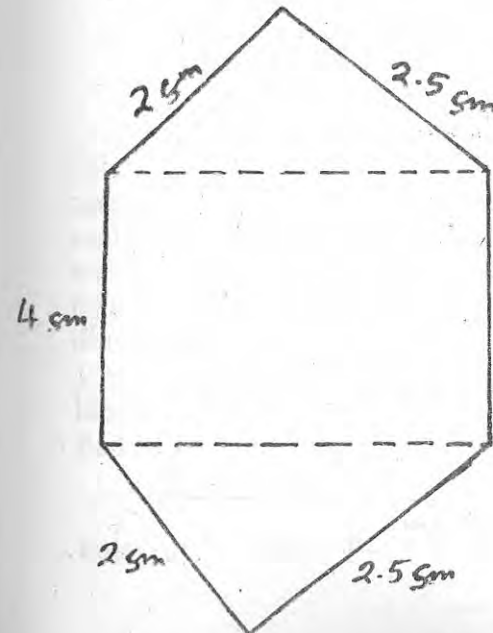
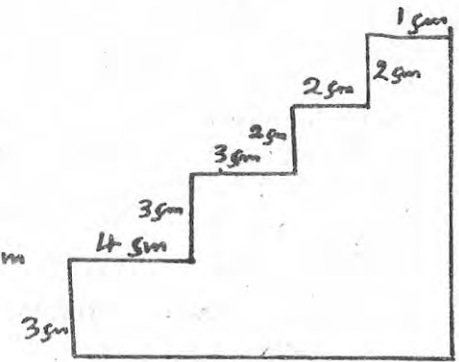
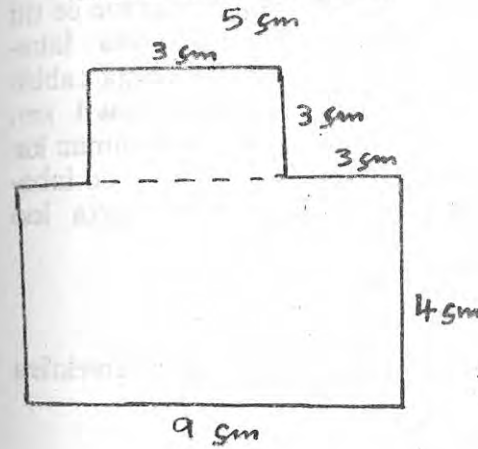
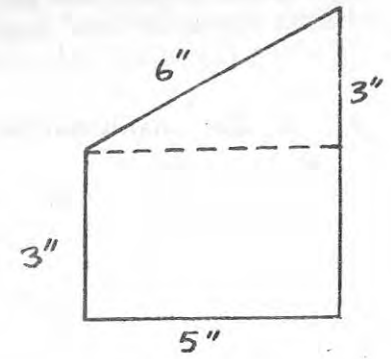
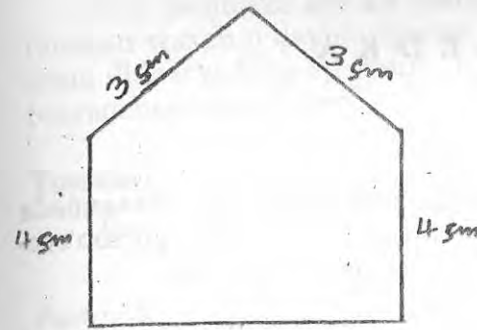
Waxa jira shaxanno ka kooban shaxanno kale sida ta hoos ku taswiiran. Wareeggedu waa dhererka xarriijimaha ay ku dhex oodan tahay oo la isugeeyey.



$$W = 3\text{cm} + 2\text{cm} + 3\text{cm} + 2\text{cm} + 4\text{cm} + 8\text{cm} + 4\text{cm} = 26\text{cm}$$

Layli :

Raadi wareegyada shaxannada hoos ku taswiiran :



B E D K A

r) Bedka labajibbaarane.

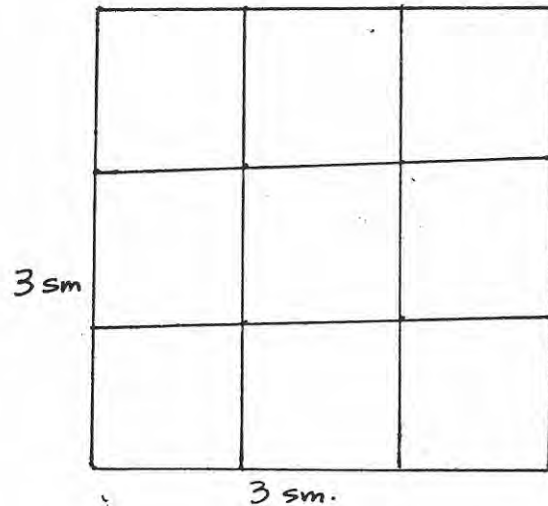
Bedka labajibbaarane, laydi, saddexagal iyo shaxannada kale ee ku dhex oodan dhawr xarriijimood waxa lagu soo saaraa iyadoo shaxanka loo qaybiyo labajibbaaranno.

Markaa, bedka shaxankaas waa inta labajibbaarane ee uu ka kooban yahay. Halbeegga cabbiraadda bedku waa labajibbaarane dhinac kastaba dhererkiisu yahay halbeegga cabbiraadeed. Bedka labajibbaarane dhinac kastaaba ~~uu~~ 1 sm. yahay waxa weeye 1 sm. oo labajibbaaran. Ka dhinac kastaba dhererkiisu yahay 1 m. bedkiisu waa 1 m. oo labajibbaaran, waxana loo qoraa 1 m^2 . Ka horana waxa loo qoraa 1 sm^2 .

Tusaale :

Raadi bedka labajibbaarane dhinac kasta dhererkiisu yahay 3 sm.

Furfurid :

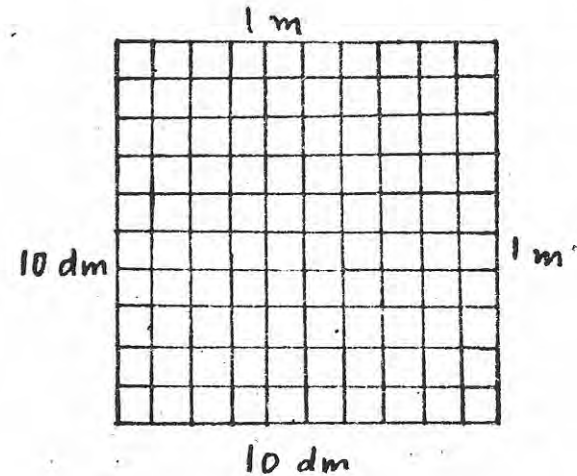


Sida jaantuska kor ku yaallaa uu muujinayo, labajibbaarahan waxan u qaybin karnaa sagaal labajibbaarane oo mid kasta dhinacyadiisu ay yihiin 1 sm. Markaa, bedka labajibbaarahanani waa 9 sm^2 .

Tusaale :

Raadi bedka labajibbaarane dhererka dhinaciisu yahay 1 m.

Furfurid :



Bedkiisu waa 1 m^2 . Haddii aan isidhaahno bedka labajibbaarana ku soo saara desimitiro labajibbaaran, waxan ogaaneynaa in uu yahay 100 dm^2 , sida jaantuska kor ku yaalli muujinayo. Labada tusaale ee hore haddaad u fiirsato, waxad arkaysaa in 9 sm^2 ay tahay 3 sm iyo 3 sm. oo la isku dhuftay; 100 dm^2 waa 10 dm. iyo 10 dm. oo la isku dhuftay. Markaa 1 m^2 waxaan odhan karnaa waa 1 m. iyo 1 m. oo la isku dhuftay. Hadda, waxan ogaanay in bedka labajibbaaranuhu yahay cabbirka dhinacii oo la labajibbaaray. Bed soo gaabintiisa waa «A».

Bedka labajibbaarane = dhinac \times dhinac = dh. \times dh.
ama $A = \text{dh.} \times \text{dh.} = (\text{dh.})^2$.

Tusaale :

Raadi inta milimitir ee labajibbaaran ee ku jirta 1 sentimitor oo labajibbaaran.

Furfurid :

Waxan ognahay in 1 sm^2 . ay tahay bedka labajibbaarane dhererka dhinacyadiisu ay yihiin 1 sm . 1 Sentimitor waxa ku jirta 10 mm .

$$\begin{aligned} \text{Markaa : } 1 \text{ sm}^2 &= 1 \text{ sm.} \times 1 \text{ sm.} \\ &= 10 \text{ mm.} \times 10 \text{ mm.} \\ &= 100 \text{ mm}^2. \end{aligned}$$

Tusaale :

Ku raadi, bedka labajibbaarane dhererka dhinaciisu yahay 1 sm ., iyo 7 mm ., milimitirro labajibbaaran.

Furfurid :

Cabbiraadda dhererka dhinaca labajibbaaranahani milimitirro ka dhig

$$1 \text{ sm. iyo } 7 \text{ mm.} = 10 \text{ mm.} + 7 \text{ mm.} = 17 \text{ mm.}$$

$$A = (1)^2 = (17 \text{ mm.})^2 = 189 \text{ mm}^2.$$

Layli :

- Jidkee lagu helaa bedka labajibbaarane?
- Ku raadi bedka labajibbaarannada dhinacyadooda lagu siiyey (b) sentimitiro labajibbaaran (t) milimitiro labajibbaaran.

b) 13 sm . t) 4 sm ., 2 mm . j) 7 m . x) 13 dm .
 kh) 14 mm . d) 1 m . 3 dm . r) 2 m . 5 sm .
 s) 5 dm . 3 sm . sh) 23 sm . dh) 31 mm .
- Ku raadi bedka labajibbaarannadan fuudhadh labajibbaaran :

b) 41 fuudh t) 1 mayl j) 2 waar , 2 fuudh
 x) 3 waar 1 fdh . kh) 42 hiish d) 10 waar 2 fdh .

- r) 3 waar 4 fuudh s) 5 waar sh) 2 fuud 4 hiish
 dh) 27 hiish .

s) Bedka Laydi.

Sida bedka labajibbaarane, bedka laydi waa inta labajibbaarane, ee mid kasta dhererka dhinaciisu yahay halbeeg cabbiraadeed, ee uu ka kooban yahay laydigu.

Tusaale :

Doon' bedka laydi dhererkiisu yahay 4 sm . ballaciisuna yahay 3 sm .

Furfurid :

| | | | | |
|----------------|----------------|----|----|----|
| | 4 sm | | | |
| | 1 | 2 | 3 | 4 |
| 3 sm | 5 | 6 | 7 | 8 |
| | 9 | 10 | 11 | 12 |

Sida jaantuska sare tusinayo 12 labajibbaarane ayaa ku jira laydigaa. Marka bedka laydigani waa 12 sm^2 . U fiiro yeelo inay 12 sm^2 . tahay 3 sm . iyo 4 sm . oo la isku dhuftay.

$$\text{Bedka} = 4 \text{ sm.} \times 3 \text{ sm.} = 12 \text{ sm}^2.$$

Tusaale :

Raadi bedka laydi dhererkiisu yahay 4 fdh . ballaciisuna yahay 2 fdh .

Furfurid :

| | | | |
|-------|---|---|---|
| 4 fd. | | | |
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |

2 fd.

Bedkiisu sida jaantuska sare muujinayo waa 8 fdh., oo labajibbaaran; 8 fdh. oo labajibbaarani waa 4 fdh. iyo 2 fdh. oo la isku dhuftay.

Tusaale :

Raadi bedka laydi dhererkiisu yahay 7 sm. 5 mm. ballaciisuna yahay 4 sm. 3 mm.

Bedka laydi waxa u dhigma dherer iyo ballac la isku dhuf-tay ama :

$$A = \text{dherer} \times \text{ballac}.$$

Haddii dhererka iyo ballacaan ku cabbirno sentimitirro bedku waa :

7.5 sm. iyo 4.3 sm. la isku dhuftay.

$$B = 7.5 \text{ sm.} \times 4.3 \text{ sm.} = 32.25 \text{ sm}^2.$$

Haddii dhererka iyo ballacaanku cabbirno milimitirrana bedku waa :

75 mm. iyo 43 mm. la isku dhuftay oo ah 3225 mm².

$$B = 75 \text{ mm.} \times 43 \text{ mm.} = 3225 \text{ mm}^2.$$

Layli :

1. Sheeg jidka lagu helo bedka laydi.
2. Raadi bedka sabuuradda fasalkiinna.
3. Raadi bededka laydiyada dhererradooda iyo ballac-yadooda hoos lagu sheegay :

Dherer

Ballac

- | | |
|-------------------|------------------|
| b) 12 dm. | 5 dm. |
| t) 6 m. | 2 m. 4 dm. 3 sm. |
| j) 60 hiish | 40 hiish |
| x) 12 waar 2 fdh. | 11 waar 2 fdh. |
| kh) 3 sm. | 8 mm. |
| d) 3 sm. 2 mm. | 1 sm. 3 mm. |
| r) 14 km. | 13 km. 8 dm. |
| s) 24 dm. | 14 mm. |
| sh) 5 sm. | 4 sm. 5 mm. |

sh) Dhinaca labajibbaarane.

Haddii lagu sheego dhinac labajibbaarane inu yahay 6 sm., bedkiisa waxad ka soo saari kartaa inaad 6 sm. labajibbaarto. Markaa bedkiisu waa 36 sm².

Haddaba, haddii lagu yidhaaho soo saar dhererka dhinac labajibbaarane bedkiisu yahay 36 sm², maxaad samayn lahayd. 36 waa tiro labajibbaaran, lixduna waa xidid labajibbaarka 36. Markaa, jidka dhererka dhinaca labajibbaaranuhu waa :

$$\text{Dhinac} = \sqrt{\text{bed}}$$

Tusaale :

Raadi dhinaca labajibbaarane bedkiisu yahay 144 sm².

Furfurid :

$$\begin{aligned} \text{Dhinac} &= \sqrt{\text{bed}} \\ &= \sqrt{144 \text{ sm}^2} \\ &= 12 \text{ sm.} \end{aligned}$$

Tusaale :

Waa intee dhererka dhinaca labajibbaarane bedkiisu yahay 1 m². iyo 69 dm².

Furfurid :

Markan, bedka halbeeggiisa cabbiraaddu isku jaad ma aha. Waxa la rabaa in aan mid u beddelno ta kale, sidan oo kale :

$$1 \text{ m}^2. = 1 \text{ m.} \times 1 \text{ m.} = 10 \text{ dm.} \times 10 \text{ dm.} = 100 \text{ dm}^2$$

$$\text{ama } 1 \text{ m}^2. = 100 \text{ dm}^2.$$

Markaa, bedkii labajibbaaranuhu waa $100 \text{ dm}^2.$ iyo $69 \text{ dm}^2.$ ama $169 \text{ dm}^2.$ Imika waxan isticmaali karnaa jidkii dhererka dhinaca labajibbaaranaha :

$$\text{Dhinac} = \sqrt{\text{bed}}$$

$$= \sqrt{100 \text{ dm}^2. + 69 \text{ dm}^2.}$$

$$= 13 \text{ dm.}$$

Layli :

1. Soo saar dhinacyada lajibbaarannada bedkooda lagu siiyey :
b) $9 \text{ m}^2.$ t) $1 \text{ mm}^2.$ j) $4 \text{ m}^2.$ x) $100 \text{ dm}^2.$
- kh) 49 hiish.
2. Beerbaa bedkeedu yahay 625 waar oo labajibbaaran. Waa intee dhererka dhinaceedu, hadday sansaan labajibbaarane leedahay?
3. Haddii miis bedka dushiisu yahay $225 \text{ m}^2.$ waa intee dhererka dhinaca dushiisu haddii ay dusha miisku labajibbaarane tahay?
4. Dhul daaqsin ah baa bedkiisu wuxu yahay $4090 \text{ m}^2.$ Haddii dhulkaasi u labajibbaarane u eg yahay, waa intee dhererka dhinaciisu?
5. Raadi dhinacyada labajibbaarannada bededkoodu yihiin :
b) $25 \text{ dm}^2.$ t) $1 \text{ dm}^2.$ j) $484 \text{ km}^2.$
x) $6 \text{ m}^2.,$ $25 \text{ dm}^2.$ kh) $1 \text{ m}^2.,$ $24 \text{ sm}^2.$

dh) Dhererka ama ballaca laydi marka bedkiisa iyo mid ahaantood lagu siiyo.

Tusaale :

Raadi dhererka laydi bedkiisu yahay $408 \text{ sm}^2.,$ ballaciisuna yahay 12 sm.

Furfurid :

$$\text{Bed} = \text{dherer} \times \text{ballac}$$

$$408 \text{ sm}^2. = \text{dherer} \times 12 \text{ sm.}$$

$$408 \text{ sm}^2. = 1. \times 12 \text{ sm.}$$

$$408 \text{ sm}^2.$$

$$\frac{\quad}{12 \text{ sm.}} = 1.$$

Markaa, dhererka laydigaasi waa 34 sm. U fiirso in dhererka laydi lagu soo saaro bedka oo ballaca loo qaybsho, marka bedka iyo ballaca lagu siiyo.

$$\text{Dherer} = \frac{\text{Bed}}{\text{Ballac}}$$

Tusaale :

Doon ballaca laydi u bedkiisu yahay $360 \text{ m}^2.$ dhererkiisuna yahay 20 m.

Furfurid :

$$\text{Bed} = \text{dherer} \times \text{ballac}$$

$$360 \text{ m}^2. = 20 \text{ m.} \times \text{ballac}$$

$$360 \text{ m}^2.$$

$$\frac{\quad}{20 \text{ m.}} = \text{Ballac}$$

$$18 \text{ m.} = \text{Ballac}$$

Markaa, ballacii la doonayey waa 18 m.

Ogow in jidka ballacu yahay bedka oo dhererka loo qaybsho, marka bedka iyo dhererka lagu siiyo.

$$\text{Ballac} = \frac{\text{bed}}{\text{dherer}}$$

Layli :

1. Doon dhererrada laydiyada bedekooda iyo ballac-yadoodaba lagu sheegay :

| | bed | ballac |
|-----|-----------------------|---------|
| b) | 4 sm ² . | 1 sm. |
| t) | 28 sm ² . | 4 sm. |
| j) | 22 sm ² . | 4 sm. |
| kh) | 124 hiish | 8 hiish |
| d) | 16 fdh ² . | 2 fdh. |
| r) | 30 sm ² . | 90 mm. |
| sh) | 30 waar ² | 27 fdh. |
| dh) | 42 mm ² . | 7 mm. |

2. Raadi ballacyada laydiyada bedekooda iyo dherer-radoodaba lagu siiyey :

| | bed | dherer |
|-----|------------------------|----------|
| b) | 528 sm ² . | 44 sm. |
| t) | 1357 sm ² . | 59 sm. |
| j) | 3588 m ² . | 138 m. |
| x) | 3850 waar ² | 154 waar |
| kh) | 7998 mayl ² | 95 mayl |
| | | 1 |
| d) | 2041 mm ² . | 72 mm. |
| | | 2 |

3. Beerbaa bedkeedu yahay 1560 waar oo labajibbaaran, dhererkeeduna yahay 65 waar. Raadi wareegeda.

4. Haddii beer wareeggedu yahay 1403 waar, ballaceeduna yahay 529 waar, waa intee bedkeedu?

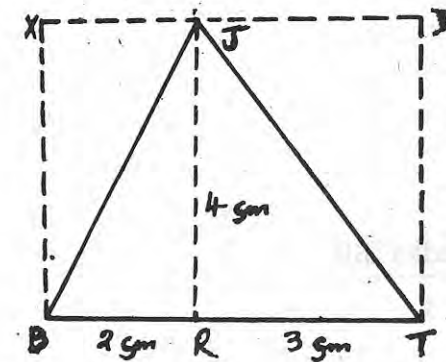
5. Nin baa iibsadey maro dhererkeedu yahay 4 mitir ballaceeduna yahay mitir iyo badh. Hadduu mitir labajibbaaranba siistay shan shilin, imisey ku joogtay maradaasi?

6. Ninbaa Dawladda hoose ee degmadiisu ay siisay jago labajibbaaran oo bedkeedu yahay 441 m². Waa intee dhererka dhinaca jagadaasi? Waa intee wareeggedu?

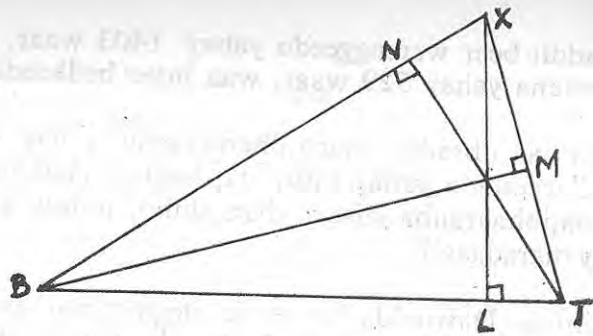
c) Bedka saddexagal.

Tusaale :

Raadi bedka saddexagalka BTJ ee hoos ku taswiiran:



Saddexagalku wuxu leeyahay saddex dhinac, saddex xaglood iyo saddex gees. Xarriijinta ka timaadda gees ku qontonta dhinaca ama dhinaca oo la fidyey waxa la yidhaa joogga saddexagalka. Dhinaca ay ku qotontana waxa la yidhaa salka saddexagalka. Jaantuska hoos ku yaal, marka BTuu salka yahay XL waa joogga; marka XTuu salka yahay BM baa joogga ah; marka XBuu salka yahayna TN baa joogga ah.



Saddexagal kasta saddex sal iyo saddex joog buu leeyahay. Jaantuska kor ku yaal, horta aan qaadanno afargeeslaha BRJX. Afargeesle kasta oo xaglihiisu qumman yihiin xarriijinta laba gees oo isku lid ah isku xidha waxa loo yaqaan: «xaglogooye», wuxuuna u kala qaybiyaa afargeeslaha laba qaybood oo isle'eg, bedka afargeeslaha sidaas oo kaluu u badhaa. Markaa, xaglogooyaha BJ ee laydiga BRJX wuu kala badhaa bedka laydiga BRJX. Wuxu u kala qaybiyaa laydiga BRJX laba qaybood oo isle'eg, oo ah BRJ iyo BJT.

$$\text{Markaa bedka BRJ} = \frac{\text{Bedka BRJX}}{2}$$

$$\begin{aligned} \text{Bedka BRJX} &= \text{dherer} \times \text{ballac} = \text{RJ} \times \text{BR} \\ &= 4 \text{ sm.} \times 2 \text{ sm.} = 8 \text{ sm}^2. \end{aligned}$$

$$\begin{aligned} \text{Markaa, bedka BRJ} &= \frac{\text{RJ} \times \text{BR}}{2} = \frac{4 \text{ sm.} \times 2 \text{ sm.}}{2} \\ &= \frac{8 \text{ sm}^2}{2} = 4 \text{ sm}^2. \end{aligned}$$

Sidaas oo kale ayuu xaglogooyaha JT ee laydiga RTDJ u kala badhaa bedka laydiga RTDJ. Bedka JRT waa bedka RTDJ badhkeed ama:

$$\text{Bedka JRT} = \frac{\text{Bedka RTDJ}}{2}$$

$$\text{Bedka RTDJ} = \text{Dherer} \times \text{ballac}$$

$$= 4 \text{ sm.} \times 3 \text{ sm.} = 12 \text{ sm}^2.$$

$$\text{Bedka JRT} = \frac{\text{bedka RTDJ}}{2}$$

$$= \frac{\text{JR} \times \text{RT}}{2}$$

$$= \frac{4 \text{ sm.} \times 3 \text{ sm.}}{2}$$

$$= \frac{12 \text{ sm}^2}{2} = 6 \text{ sm}^2.$$

BRJ iyo JRT oo la isku daray waa BJT, oo ah saddexagalkii an bedkiisa raadineynay. Markaa, bedka BJT:

$$= 4 \text{ sm}^2. + 6 \text{ sm}^2. = 10 \text{ sm}^2.$$

U fiirso bedka saddexagalka BJT iyo sidii lagu helay bedka BJT.

$$\text{Bedka BJT} = \frac{\text{JR} \times \text{BR}}{2} + \frac{\text{JR} \times \text{RT}}{2}$$

$$= \frac{4 \text{ sm.} \times 2 \text{ sm.}}{2} + \frac{4 \text{ sm.} \times 3 \text{ sm.}}{2}$$

$$= \frac{(\text{JR} \times \text{BR}) + (\text{JR} \times \text{RT})}{2}$$

$$= \frac{(4 \text{ sm.} \times 2 \text{ sm.}) + (4 \text{ sm.} \times 3 \text{ sm.})}{2}$$

$$= \frac{\text{JR} (\text{BR} + \text{RT})}{2} = \frac{4 \text{ sm.} (2 \text{ sm.} + 3 \text{ sm.})}{2}$$

$$= \frac{JR \times BT}{2} = \frac{4 \text{ sm.} \times 5 \text{ sm.}}{2} = 10 \text{ sm}^2.$$

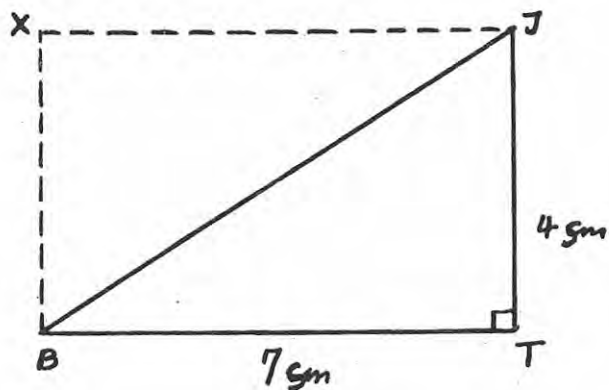
$$\text{Bedka saddexagalka BJT} = \frac{JR \times BT}{2}$$

JR waa joogga saddexagalkan marka BT ay tahay salka. Markaa waxan odhan karnaa bedka saddexagalku waa badhka joogga iyo salka oo la isku dhuftay :

$$\text{Bedka saddexagalka} = \frac{\text{Joog} \times \text{Sal}}{2}$$

Tusaale :

Doon bedka saddexagalka BTJ ee hoos ku taswiiran :



Xarriijinta JT haddii salka saddexagalka aan ka dhiganno, jooggiisu waa BT waayo BT way ku qotontaa JT, haddii BT aan salka ka dhiganno JT baa joogga noqonaaya. BJ waa xaglogooyaha XBTJ.

Bedka laydiga XBTJ = dherer \times ballac. Mar haddii xaglogooyaha BJ bedka laydiga XBTJ uu laba isle'eg u kala qaybinayo, bedka Δ BTJ wuxu noqonayaa bedka XBTJ badhkii.

$$\begin{aligned} \text{Bedka } \Delta \text{ BTJ} &= \frac{\text{Bedka XBTJ}}{2} = \frac{BT + JT}{2} \\ &= \frac{7 \text{ sm.} \times 4 \text{ sm.}}{2} = \frac{28 \text{ sm}^2}{2} \end{aligned}$$

Waan ognahay BT iyo JT inay joog iyo sal u kala noqonayaan Δ BTJ. Guud ahaan, bedka saddexagal waxa lagu heli karaa joogga iyo salka oo la isku dhufto oo laba loo qaybiyo.

$$\text{Bedka saddexagal} = \frac{\text{Sal} \times \text{joog}}{2}$$

Layli :

1. Raadi bedka saddexagalka salkiisa iyo jooggiisa lagu siiyey :

dh) 2 m. 5 sm. 3 dm. 4 sm.

b) 41 sm. 24 sm.

t) 32 hiish 12 hiish

j) 24 waar 14 fdh.

x) 3 sm. $\frac{1}{2}$ m.

kh) 0.3 m. 8 sm.

d) 4 sm. $\frac{1}{3}$ dm.

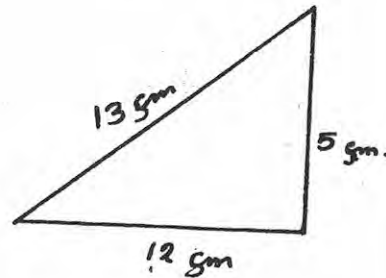
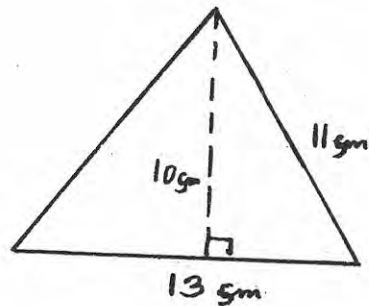
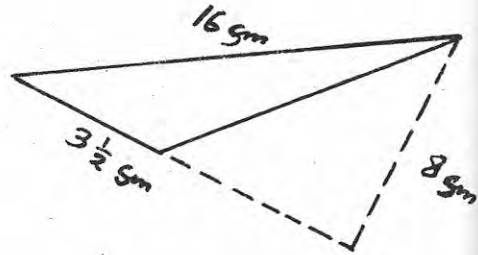
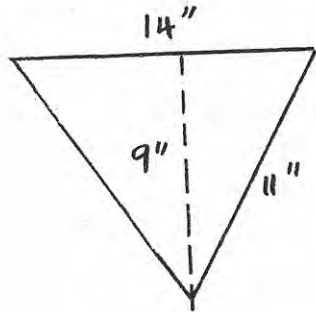
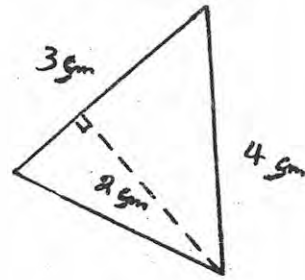
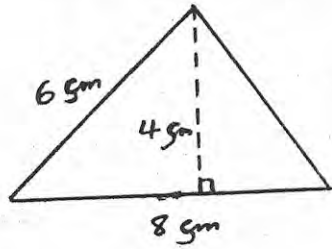
r) 2 hm. 3 dm.

s) $\frac{1}{4}$ km. 300 m.

sh) 2 m. 5 sm. 3 dm. 4 sm.

dh) 2 fdh. 1 waar

2. Raadi bededka saddexagallada hoos ku taswiiran :



Tusaale :

Doon joogga saddexagal bedkiisu yahay 120 sm^2 , sal-kiisuna yahay 24 sm .

Furfurid :

Waxan naqaan in

$$\text{bedku} = \frac{\text{joog} \times \text{sal}}{2}; \quad 120 \text{ sm}^2 = \frac{\text{joog} \times 24 \text{ sm}}{2}$$

kol haddii isku dhufashada iyo isuqaybintu ay isweydaar yihiin waxa dhab ah in :

$$2 \times 120 \text{ sm}^2 = \text{joog} \times 24 \text{ sm}.$$

Markaan labada dhinac ee isle'egta 24 sm . u qaybino waxan heleynaa :

$$\frac{2 \times 120 \text{ sm}^2}{24 \text{ sm}} = \text{joog}.$$

$$\therefore 10 \text{ sm} = \text{joog}.$$

Markaa joogga saddexagalkani waa 10 sm .

U fiirso in joogga lagu helay markii 2 bedka lagu dhuf-tay ee tarantiina 24 sm . loo qaybiyey.

Guud ahaan, marka lagu siiyo bedka iyo salka saddexa-gal, jidka lagu helo jooggu wuxu yahay :

$$\text{joog} = \frac{2 \times \text{bed}}{\text{sal}}$$

Sidoo kale, haddii lagu siiyo joogga iyo bedka saddexagal jidka lagu helo salku wuxu yahay :

$$\text{Sal} = \frac{2 \times \text{bed}}{\text{joog}}$$

Layli :

$$1. \text{ Caddee in sal} = \frac{2 \times \text{bed}}{\text{joog}}$$

2. Soo saar salka saddexagalka bedkiisa iyo jooggiisa lagu siiyey.

| Bed | Joog |
|-------------------------------------|--------------------|
| b) 112 m ² . | 8 m. |
| t) 24 mm ² . | 4 mm. |
| j) 38 m ² . | 3 sm. |
| x) $4\frac{1}{2}$ sm ² . | $1\frac{1}{2}$ mm. |
| kh) 8.4 m ² . | 28 sm. |
| d) 121 fdh ² . | 22 fdh. |
| r) 28 hiish ² . | 7 hiish. |
| r) 148 sm ² . | 17 sm. |
| sh) 150 mm ² . | 45 sm. |

4. Beer leh qaab saddexagal iyaa bedkeedu yahay 24 m²., jooggeeduna yahay 8 m. Waa intee salkeedu?

5. Beer saddexagal ah baa bedkeedu yahay 256 waar oo labajibbaaran, salkeeduna 32 fdh. yahay. Waa imisa jooggeedu?

HABDHISKA TIRADA

Tirsiimo :

Ururka, kow, laba, saddex iyo sidaas oo kale, waxa lagu magacaabaa tirsiiimo. Tirsiiimadu waxay inna tustaa tirada waxyaabaha ku jira urur. Kowdu waa tirada ugu yar tirsiiimada. Eber kama mid aha ururka tirsiiimo.

Tilmaan kale oo lagu garan karo muuqaalka tirooyinka tirsiiimo waa habka siimoon ay isugu qoofalan yihiin una hannaansan yihiin oo ah tiro waliba ta ka horaysa inay mid (hal) ka badan tahay.



Astirooyinka ururka tirsiiimo ee hoos ku qorani si hab siimoon, kuna bilaabmaya kow, bay u taxan yihiin.

1, 2, 3, 4, 5, 6, 7, 8, ...

Saddexda barood waxay tilmaami ama tusi xidhiidhka ay u taxan yihiin tirooyinka tirsiiimo, isuna daba sunsumaan qaabkaas oo kale ilaa meel aan la sugi karin.

1. Oodnaanshaha tirsiiimo.

Haddii aynnu isugeyno laba tiro oo tirsiiimo, wadartoodu waa tiro kale oo tirsiiimo.

Tusaale bal aan qaadanno :

5 waa tiro tirsiiimo, 3 na waa tiro tirsiiimo.

$5 + 3 = 8$ iyo 8 qudh ah.

8 oo wadarta ihi waa tiro tirsiiimo. Tusaalooyinkan soo

socdaana waxay ina tusayaan haddii tirooyin tirsiiimo laysu geeyo wadartoodu waa tiro kale oo tirsiiimo.

$$\begin{aligned}19 + 4 &= 23 \text{ iyo } 23 \text{ qudh ah} \\6 + 6 &= 12 \text{ iyo } 12 \text{ qudh ah} \\10 + 90 &= 100 \text{ iyo } 100 \text{ qudh ah} \\1429 + 357 &= 1786 \text{ iyo } 1786 \text{ qudh ah}\end{aligned}$$

Dhab ahaantii, haddii aynu isugeyno laba tiro oo tirsiiimo, wadartoodu waa tiro tirsiiimo. Sidaa awgeed, waxaynu odhan karnaa ururka tirsiiimo waa ku oodnaa isugeynta.

Haddii aynu dib u fiirino tusaalooyinkaas aynu soo qaadannay, waxa inoo muuqan doona jiritaanka wadarta 5 iyo 3 ama ay jirto tiro ah wadarta 19 iyo 4. Run ahaantii way jirtaa wadarta labadii tiro ee ururka tirsiiimo ka mid ahiba.

Bal day $5 + 3 = 8$ iyo 8 qudh ah, ee maaha tiro kale sida 31 ama 526.

Kol hadduu jiro mid iyo mid qudh ah, ee wadarta $19 + 4$, waxaynu odhan doonnaa wadartu waa madi.

Oodan lahaanshada isugeynta.

Haddii ay a iyo b yihiin tirooyin ku jira ururka tirsiiimo markaa $a + b$ waxa weeye tiro ku jirta ururka laftiisa.

Bal tusaale u soo qaado, haddii a iyo b ay yihiin laba tiro oo tirsiiimo, markaa $a + b$ way jirtaa, waana madi waana tiro tirsiiimo.

Haddii aynu qaadanno xisaabfalka kala goynta, meeshii isugeynta, waxaynu ogaaneynaa in kala goyntu aanay oodin ururka tirsiiimo. Sida $9 - 9 = 0$ iyadoo aan 0 ahayn tiro tirsiiimo.

Hormagelinta isugeynta.

Bal isku day inaad isugeyso tirooyinkan 5, 8 iyo 6 isla mar qudh ah, maxaa dhici? Ma waxaad ka bilaabi inaad isugeyso labada ugu horreeya, haddana aad u geeyso ka saddexaad? Malaha sidan baad odhan lahayd?

$$5 + 8 = 13 \text{ haddana } 13 + 6 = 19$$

$$\text{amaba sidan : } 8 + 6 = 14 \text{ haddana } 5 + 14 = 19.$$

Haddii aynu dheehanno labada tusaale waxaynu arki in isugeyntu astaantan leedahay : Isugeyntu waa xisaabfal hadba laba tiro laysu geeyo isla mar qudh ah. Sidaa awgeed isugeyntu waa xisaabfal lammaaneeye ah.

Ta labaad : Wadarta isugeyntu waa mid iyo isla mid kaliya, habkaynu doono aan isugeeyno eh.

Gargaarsiga ama kaalmaysiga bilaha ayaa inna gaadhsiin kara ama tusi doona jawaabta habboon. Tusaalaha hore waxa loo qori karaa sidan :

$$\begin{aligned}5 + 8 + 6 &= (5 + 8) + 6 \\&= 13 + 6 \\&= 19\end{aligned}$$

Tii labaadna waxa loo qori karaa :

$$\begin{aligned}5 + 8 + 6 &= 5 + (8 + 6) \\&= 5 + 14 \\&= 19\end{aligned}$$

Kol hadday jawaabaha u dambeeyey isku mid yihiin waxa loo qori karaa sidan :

$$(5 + 8) + 6 = 5 + (8 + 6)$$

Baro weedhahan. Mid waliba dhab (run) ma tahay?

$$(4 + 17) + 11 = 4 + (17 + 11)$$

$$(57 + 8) + 37 = 57 + (8 + 37)$$

$$(643 + 72) + 189 = 643 + (72 + 189)$$

Weedhahaasi waxay inna tusayaan astaan isu geyntu leedahay, waxana lagu magacaabaa hormagelinta isu geynta.

Haddii ay a , b iyo c yihiin tirooyin tirsiiimo, markaa hormagelinta isugeynta waxa loo jidayn karaa sidan hoos ku qoran.

2. Xeerka Hormagelinta isugeynta.

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

Kala Hormarinta isugeynta

Waxa jirta astaan kale oo isugeyntu leedahay, laguna tilmaamay tusaalooyinkan soo socda :

$$\begin{aligned} 6+2 &= 2+6 & 10+6 &= 6+10 \\ 7+15 &= 15+7 & 18+3 &= 3+18 \end{aligned}$$

Weedhaha xagga sare ku qorani waxay inna tusayaan in tirooyinka tirsiiimo la isugu geyn karo habkii la doonaba, iyadoo wadartu aanay isbeddeleyn waxaana lagu magacaabaa kala hormarinta isugeynta.

Haddii ay a iyo b yihiin tirooyin tirsiiimo, markaa kala hormarinta isugeynta waxa loo jidayn karaa sidan ama habkan soo socda :

3. Xeerka kala hormarinta isugeynta

$$a+b = b+a$$

Sheeg weedhahan soo socda astaamaha isugeynta ee ay waafajisan yihiin :

- $(8+3)+12 = 8+(3+12)$
- $(8+3)+12 = 12+(8+3)$
- $(3+6)+(11+7) = (11+7)+(3+6)$
- $19+(8+2) = (19+8)+2$
- $121+13 = 13+121$
- $(37+21)+12 = 37+(21+12)$
- $(7+3)+15 = (3+7)+15.$

Astaamaha isku dhufashada

Sidii isugeynta oo kale isku dhufashadu waxay leedahay astaamo u gaar ah.

Oodan lahaanshada isku dhufashada

2 iyo 3 waa laba tiro oo tirsiiimo tarantooduna waa 6 oo ah tiro tirsiiimo. Haddii ay a iyo b yihiin laba tiro tirsiiimo tarantooduna waa $a \times b$ oo ah tiro ka mid ah ururka tirsiiimo.

Hormagelinta isku dhufashada

Tusaalooyin :

$$\begin{aligned} (3 \times 2) \times 4 &= 3 \times 2 \times 4 = 3 \times (2 \times 4) \\ 6 \times 4 &= 3 \times 8 \\ 24 &= 24 \\ 10 \times (6 \times 3) &= (10 \times 6) \times 3 \\ 10 \times 18 &= 60 \times 3 \\ 180 &= 180 \end{aligned}$$

Haddii ay a , b iyo c yihiin tirooyin tirsiiimo, markaa Hormagelinta isku dhufashada waxa loo jidayn karaa sidan :

$$\begin{aligned} (a \times b) \times c &= a \times (b \times c) \\ (a \times b) \times c &= abc = a \times (bc) \\ (a \cdot b) \cdot c &= a \cdot (b \cdot c) \end{aligned}$$

Kala Hormarinta isku dhufashada

Tusaalooyin :

$$\begin{aligned} 3 \times 2 &= 6, & 2 \times 3 &= 6, & \text{Kolkaa } 3 \times 2 &= 2 \times 3 \\ 8 \times 10 &= 80, & 10 \times 8 &= 80, & \text{Kolkaa } 8 \times 10 &= 10 \times 8 \\ 4 \times 120 &= 480, & 120 \times 4 &= 480, & \text{Kolkaa } 4 \times 120 &= 120 \times 4 \end{aligned}$$

Haddii ay a iyo b yihiin laba tiro oo tirsiiimo markaa kala Hormarinta isku dhufashada tirooyinka tirsiiimo waxa loo jidayn karaa sidan oo kale :

5. Xeerka Kala Hormarinta Isku Dhufashada

$$a \times b = b \times a \quad \text{ama}$$

$$ab = ba$$

Kala goynta iyo isuqaybinta labadooduba ma Hormogaan mana kala hormaraan :

Layli :

Sheeg weedhahan soo socda astaamaha isku dhufashada tirooyinka tirsiiimo ay wafajisan yihiin :

$$1. \quad 5 \times (15 \times 4) = (5 \times 15) \times 4$$

$$2. \quad 36 \times (2 \times 4) = (2 \times 4) \times 36$$

$$3. \quad (3 \times 5) \times (6 \times 2) = (6 \times 2) \times (3 \times 5)$$

$$4. \quad (3 \times 4) \times (2 \times 5) = (3 \times 4) \times (2 \times 5)$$

$$5. \quad 5 \times (2 \times 3) \times 7 = (5 \times 2) \times 3 \times 7$$

$$6. \quad (5 \times (2 \times 3)) \times 7 = 7 \times (3 \times (2 \times 5))$$

6. Kala Dhig

Haddaad iibiso saddex tigidh oo min afar shilin ah maanta, berrina iibiso lix min afar shilin ah, immisaad lacag hantiyi?

Waxaad ku jawaabi :

$$4 \times (3+6) = 4 \times 9 = 36 \quad \text{ama}$$

$$(4 \times 3) + (4 \times 6) = 12 + 24 = 36$$

Kol hadday jawaabti u dambaysay isku mid tahay waxaad odhan kartaa : $4(3+6) = (4 \times 3) + (4 \times 6) = 36$.

Habka caynkaas u saameeya tirooyinka tirsiiimo waxa lagu magacaabaa kala dhigga isugeynta ee isku dhufashada. Ujeeddadu waxay tahay : Isku dhufashadu way kala dhigtaa isugeynta.

Haddii a , b iyo c yihiin tirooyin tirsiiimo, markaa kala dhigga isugeynta ee isku dhufashada waxa loo jidayn karaa sida soo socota :

$$a \times (b+c) = (a \times b) + (a \times c)$$

$$\text{ama } a(b+c) = ab + ac$$

Laylisyo :

Dhammee weedhahan soo socda si ay u tusaan kala dhig :

$$1. \quad 15 \times (7+12) = \text{-----}$$

$$2. \quad (14 \times 7) + (14 \times 36) = \text{-----}$$

$$3. \quad (121+43) \times 35 = \text{-----}$$

$$4. \quad 1421(282+57) = \text{-----}$$

$$5. \quad (98+556) \times 152 = \text{-----}$$

7. Asal Madoorshaha isku dhufashada

Tirada kow waa ta ugu yar ururka tirsiiimo. Waxayna leedahay astaamo gaar ah :

$1+1 = 2$, $2+1 = 3$, $3+1 = 4$, $4+1 = 5$ iyo sidaas oo kale. Hubaal ahaanshada inay $1 \times 1 = 1$ iyo kala dhigga ayaa ku filan inaan xaqiijinno **astaa**n kale oo ay kow leedahay:

$$1 \times 4 = 1 \times (1+1+1+1)$$

$$= (1 \times 1) + (1 \times 1) + (1 \times 1) + (1 \times 1)$$

$$= 1+1+1+1$$

$$= 4$$

Kol hadday isku dhufashadu kala hormarto

$$1 \times 4 = 4 \times 1 \text{ iyo } 1 \times 17 = 17 \times 1.$$

Isma beddesho tiro haddii lagu dhufsto kow. Waxa lagu magacaabaa tirada kow, Asal madoorshaha isku dhufashada.

Haddii ay a tahay tiro ka mid ah ururka tirsiiimo, markaa Asal madoorshenimada isku dhufashada ee kow waxa loo jidayn kara sidan hoos ku tifaftiran :

$$1 \times a = a = a \times 1$$

1 haddaba waa asal madoorshaha isku dhufashada.

E B E R

1. Astaamaha eber u gaar ah

Tirada eber ma aha tiro ka tirsan ururka tirsiiimo, hase ahaatee wuxuu gaar u leeyahay astaamaha aynu sheegi doonno:

Bal aan baarno waxa dhici kara haddaan eber wax u geynno, ka geynno, ku dhufanno, ama u qaybinno.

$$3 + 0 = 3, \quad 17 + 0 = 17, \quad 0 + 21 = 21$$

Haddii aan eber u geynno tiro kasta oo ka mid ah ururka tirsiiimo, ama tiro kasta oo tirsiiimo u geyno eber, wadartu waa tirada lafteeda. Haddaba waxa eber lagu magacaabaa asal madoorshaha isugeynta.

Hadday a u taagan tahay tiro ah tirsiiimo waxa loo jidayn karaa astaanta u geynta ee eber sidan :

$$a + 0 = 0 + a$$

Astaantan u geyntu, haddana waa dhab markay a u taagan tahay eber.

Ka goo eber tirooyin dhowr ah oo tirsiiimo. Hawraartani $n - 0 = n$ run ma ku tahay tiro kasta oo tirsiiimo?

Waan soo barannay weedhahan soo socda ee isku dhufashada.

$$0 \times 5 = 0, \quad 7 \times 0 = 0$$

Taasi waxa weeye haddii mid ama labada isirba ay yihiin eber had iyo jeer tarantu waa eber.

Tiradee n u taagan haddii weedhahan soo socda ay run yihiin :

$$n \times 3 = 0, \quad 17 \times n = 0$$

Haddii taranta laba tiro ay tahay eber, markaa mid ama labada tiro waa inay noqotaa ama noqdaan eber. Taasi way jirtaa, waayo oodan lahaanshaha ayaa inoo xaqiijinaya inay taranta laba tiro oo tirsiiimo tahay tiro kale oo tirsiiimo, oo anay ahayn eber.

Eber wax ma u qaybin karnaa?

Waxaynu ogsoon nahay $6 \div 2 = 3$ maxaa yeelay $3 \times 2 = 6$.

Bal ka soo qaad $3 \div 0$ inay tahay tiro ay n u taagan tahay. Taasi waxay tahay $3 \div 0 = n$. Haddaba $3 = n \times 0$ waa inay run noqotaa iyaduna, maxaa yeelay qaybtu waa weeydaarka isku dhufashada. Tiradee bay n u taagnaan kartaa?

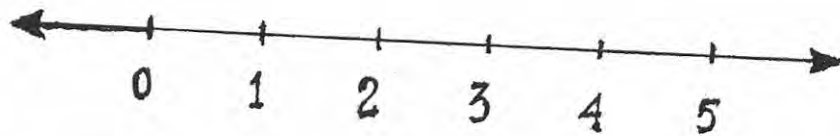
Mar haddii $3 = n \times 0$, tiradii kasta ee aynu ku beddelno n weedha been bay ka dhigi. Markaa ma jirto tiro ay n u taagnaan kartaa. Sidaa awgeed, waxaynu odhan u qaybin eber waa macno la'aan; eber waynu ka reebnaa qaybshayaasha.

HABDHISKA TIRADA IYO XARRIIQDA TIRADA

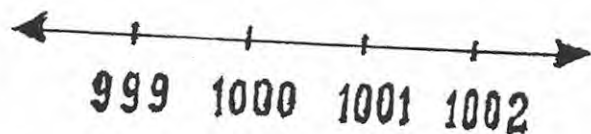
Hore waxaan u soo baranay tirooyinka tirsiiimo oo si siimoon oo dhammaad la'aana isu daba susumayey. Iyadoo ahayd, ahna tirada aynu wax ku tirsanno ma sugi karno meel ay ku dhammaato; waayo haddii aan haysanno tiro, mar kasta waxaynu ku dari karnaa koow (1) waxaynu heli doonnaa tiro kale. Ujeeddadu waxay tahay, haddii aad qaadato tiro sida 342, markaad ku darto hal waxaad heleysaa 343. Sidoo kale haddaad qaadatid tiro kastoo tirsiiimo, mid kaluum baad heleysaa markaad tii hore hal (1) ku darto.

1. Xarriiqda Tirada

Tirooyinka tirsiiimo iyo eber (tirooyin idil) waxaan ku muujin karnaa xarriiq. Kasoo qaad inaad haysato xarriiq toosan. Xarriiqdan halkaad doontid u qaado bilowga. Kasoo qaad halka bilowga ihi inay u taagan tahay tirada eber (0). Meel kale oo eber midigta ka xigta u qaado inay u taagan tahay tirada kow (1). Haddii imika xarriiqda xaggeeda midig aad ka goysid intay eber iyo kow isu jiraan, waxaad heleysaa tirooyin tirsiiimo oo kale sida hoos ka muuqata.



Haddii habkaa loo sii wado, markay tirooyinku bataan, in xarriiqda ka mid ihi waxay u muuqanaysaa sidan hoos ku muujisan.

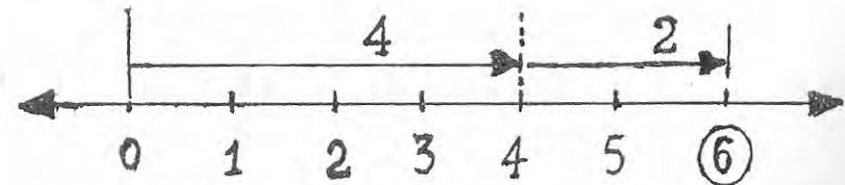


2. Isugeynta iyo isku dhufashada xarriiqda tirada guudkeeda

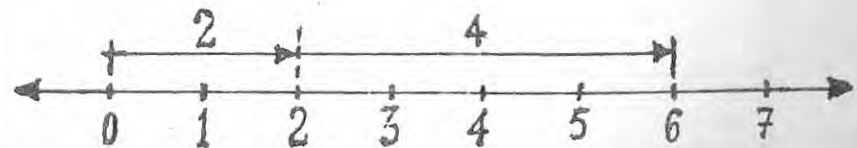
Xarriiqda tirada waxa loo adeegsan karaa in si bayaan ah loogu sawiro isugeynta iyo isku dhufashada tirooyinka.

3. Isugeyn tirooyin tirsiiimo

Xusuuso in $4+2$ ay la magac tahay tirada la helo marka afar lagu daro laba. Isugeyntan waxa loo dhigi karaa geeddi eber ilaa 4 xarriiqda tirada guudkeeda ah oo haddana bartan looga sii guuray laba halbeeg xagga midig. Taasi waxay la mid tahay adoo ka bilaaba eber oo midig u socda ilaa aad lix ka gaadho. Eeg jaantuska hoose.



Isugeynta $2+4$ waxa lagu muujiyey xarriiqda tirada ee jaantuska hoose.

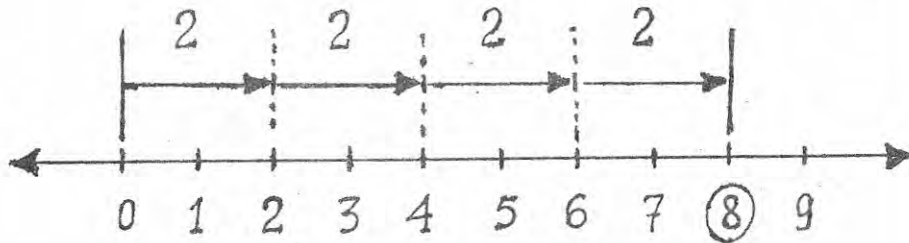


Jaantusyada 3 iyo 4, waxay ku tusayaan in $4+2 = 2+4$. Laba tiro oo kasta haddii laysu geeyo waxaad arkaysaa in sida laysugu daraa aanay wax sii ridan ahayn. Macnaha taasi waxa weeye in astaanta KALA HORMARINTA ISUGEYNTA ee $2+4 = 4+2$ gaar ahaan, iyo $(a+b) = (b+a)$ guud ahaan si hawl yar loogu muujin karo xarriiqda tirada.

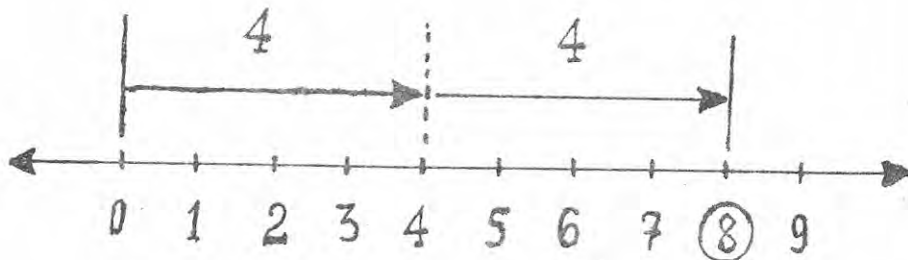
4. Isku dhufashada (tirooyin tirsiimo) iyo xarriiqda tirada.

Habka iskudhufashadu wuxu u eg yahay ka isugeynta. Iskudhufashadu waa isugeyn laysu celceliyey. 4×2 waa astada tirada la helo marka laba afar goor laysu geeyo, $(2+2+2+2)$.

U adeegso fogaanta eber ilaa laba cabbiraad ahaan, daba-deedna eber uga dhaqaaq xagga midig afar dherer oo caynkaas ah. Waxaynu u muujin karnaa iskudhufashada 4×2 sidan.



Isku dhufashada 2×4 waxa lagu muujiyey xarriiqda tirada ee jaantuska hoose.



Inkastoo labada jaantus ee sare ayna isu ekayn haddana go'aankoodu waa isla mid. Markaa, $2 \times 4 = 4 \times 2$, taasoo ah astaanta kala hormarinta iskudhufashada. Taasina waxay ina leedahay in lagu muujiyo astaanta kala hormarinta iskudhufashada xarriiqda tiradu wax sii ridan ma aha.

Laylisyo :

Sawir xarriiq tiro, guudkeedana ku muuji xisaabfalladan soo socda :

- | | | |
|------------------|------------------|------------------|
| (b) $3+5$ | (t) 2×3 | (j) $4+6$ |
| (x) 2×5 | (kh) $0+6$ | (d) 4×1 |
| (r) 4×0 | (s) $6+6$ | (sh) $4+4$ |

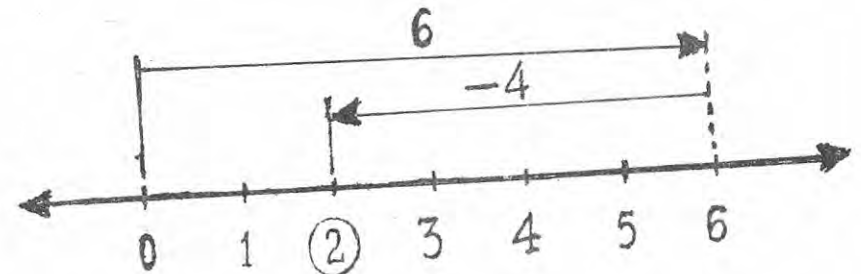
5. Kala goyn (tirooyin tirsiimo).

Waataynu hore u soo aragnay sida laba tiro laysugu daro adoo adeegsanaaya xarriiqda tirada. Waxa kaloon ognahay inay kala goyntu tahay weydaarka xisaabfalka isugeynta. Haddaba, sidee baynu u kala goyn karnaa laba tiro inagoo fiirinayna xarriiqda tirada. Isugeynta waxaynu ku sheegnay ama ku tilmaanay midig (hor) u socosho. Markaa kala goynta, weydaarka xisaabfalka isugeynta, waxaynu ku sheegi bidix (dib) u socosho.

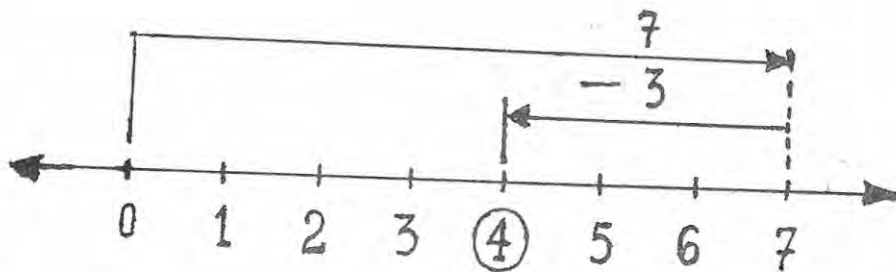
Bal eeg tusaalahan :

$$6 - 4 = ? \quad 7 - 3 = ?$$

xarriiqda tirada markaad eegto, $6-4$ waxay la mid tahay adoo eber (0) ka bilaabay oo midig u kacay ilaa aad lix (6) gaadhid; dabadeedna aad bidix afar (4) u soo noqotid. Kolka waxaad taagan tahay 2. Eeg jaantuskan



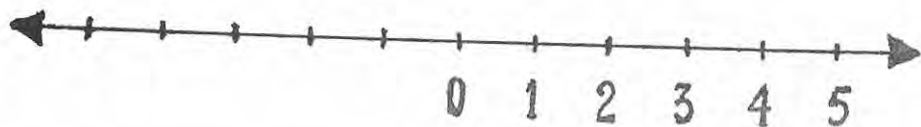
Hab uhaan, 7-3 waxba kama duwana ta 6-4. Eeg jaantuskan



Bal isku day inaad ku muujiso 3-7 xarriiqdii tirada. Eber ma midig baad ka xigtaa? Mise meel aad u jeeddaba ma aad garan! Malaha eber bidix baad ka xigtaa! Oo eber ma waxbaa bidix ka xiga?

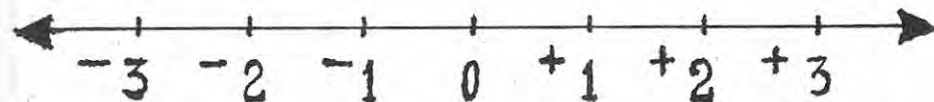
ABYOONEYAASHA

Su'aalihii ka dhashay 3-7 waxay inna dareensiiyeen in looga baahan yahay tirooyin kale bidixda eber, si jawaab shaafisa loogu helo su'aalaha. Si hawl yar ayaynu xarriiq tirada ugu sunti goobaha tirooyinka eber bidix ka xiga. Sidii aynu u sumadnay tirooyinka tirsiimo oo kale ayaynu kuwanna u astayn. Fogaanta eber ilaa kow ayaynu u qaadan halbeega cabbiraadda, kuna meelayn doonnaa goobaha sida ku muujisan jaantuska hoose.



Goobahaa aynu sumadnay maxaynu ku astaynnaa?

Astirooyinkii ahaa 1, 2, 3, ayaynu ku astayn. Si aynu astirooyinkii hore (Astoooyinka tirooyinka tirsiimo) iyo kuwan dambe u kala garano waxaynu ku kala sunti astoooyin ah + ama - oo kuna xiran docda ay eber ka xigaan, midig ama bidix. Baro jaantuska hoose.



Astirada -1 waxa loo akhriyaa kow taban, +2 waxa loo akhriyaa laba togan.

Dheeho xarriiqda tirada dhinaca leh tirooyinka taban. Waynu u socon karnaa bidixda eber dhammaad la'aan sidii aynu ku soo marnay midigta eber.

Ururkan tirooyinka tidicyada ku dhex jira waxa la yiraa :

Abyooneyaal.

$$\{ \dots -4, -3, -2, -1, 0, +1, +2, +3, +4 \dots \}$$

Ururkan tirooyinka hoos ku muujisan waxa la yiraa :

Abyooneyaal togan.

$$\{ +1, +2, +3, +4, \dots \}.$$

Ururkan waxa kagoon u naqaanaa tirooyin tirsiimo. Ururka tirooyinka hoos ku qoran waxa la yiraa : **Abyooneyaal taban.**

$$\{ -1, -2, -3, -4, \dots \}.$$

Ogow inaan eber lagu darin labada urur midna. Markaynnu eber ku darno ururradaa waxaynu u magacaabi doonnaa sidan soo socota :

$$\{ 0, +1, +2, +3, +4, \dots \}.$$

Ururka tirooyinkan waxa loo yaqaan abyooneyaal aan tabnayn ama tirooyin idil, (abyooneyaal togan iyo eber).

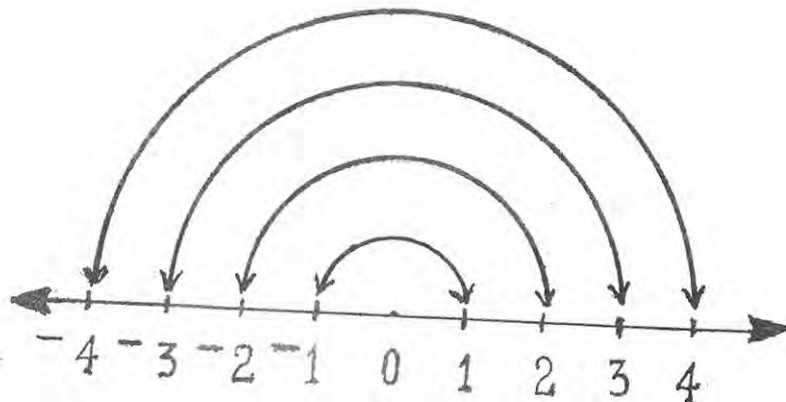
$$\text{Ururka tirooyinka } \{ 0, -1, -2, -3, -4, \dots \}$$

waxa la yiraa abyooneyaal aan togneyn, ama abyooneyaasha taban iyo eber. Waxba kuma jabna, waana la dhaafi karaa qoridda astada + ee toгнаanta.

Hadda, bal aynu laba laba isuguaaddinotirooyinka eber in isle'eg labada docood uga wada jira. Taasi waxa weeye 3 iyo -3 inay fogaan isle'eg eber u kala jiraan. Markaa -3 waxaynu ku lammaanin 3; ama 3 iyo -3. Tiradee baad ku lammaanin 7? ama 6?. Eber tiradeed ku lammaanin?

Mar haddii laba tiro oo lammaankaasi ihi ay labada docood ee eber iskaga soo horjeedaan waxa loo yaqaan: iska horjeedayaal.

Kasoo horjeedka abyoone aan eber ahayn waa abyoone kale oo fogaan taa le'eg eber u jira.



$$-3 \text{ waa kasoo horjeedka } 3$$

$$2 \text{ waa kasoo horjeedka } -2$$

$$0 \text{ waa kasoo horjeedka } 0$$

Bal aynu u adeegsanno summaddii kala goynta « - » inay gasho meeshii kasoo horjeedka. Markaa hawraaraha kore waxa loo qori karaa sidan :

$$-3 = -3; \quad 2 = -(-2); \quad 0 = -0$$

Eeg astooyinka -3 iyo -3. Waxa muuqata in -3 iyo -3 yihiin laba magac oo tiro qudh ah. Meesha iyo jimirka jiidintu beddeli mayso tirada. Kolkaa, uma baahnin labada asto (-) iyo - inay magacaabaan tiro taban. Haddaba aan u adeegsanno summadda kala goynta, astada kasoo horjeedka iyo tabnaanta, waayo iyadaa lagu ismaali karayaa abyooneyaashoo dhan.

Haddaba, hawraarihii hore waxaan u qori karnaa sidan :

$$-3 = -3; \quad 2 = -(-2); \quad 0 = -0$$

Ogow in $2 = -(-2)$ ay tahay kasoo horjeedka tiro horjeedkiisu waa tirada lafteeda.

Laylisyo :

1. Ka jawaab (iyadoon waxba la qorin haddii la rabo):
 - (b) Tiradii tirsiiimo ma ku dhex jirtaa tirada abyooneyaasha?
 - (t) Waa maxay kasoo horjeedka tiro kasoo horjeedkiisa kasoo horjeedkiisu?
 - (j) Waa maxay nooca tirada $-x$ haddii x u taagan tahay abyoone togan?; haddii x u taagan tahay eber?
 - (x) Waa maxay nooca tirada x noqon karto;

haddii $-x$ u taagan tahay abyoone togan?

haddii $-x$ u taagan tahay abyoone taban?

haddii $-x$ u taagan tahay eber?

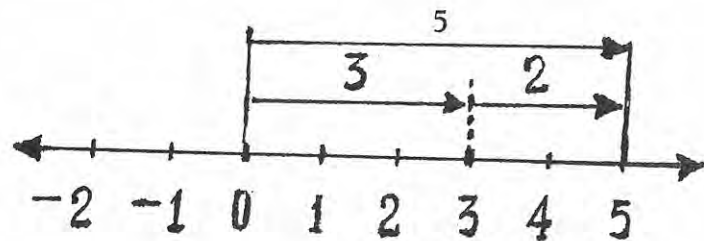
2. Qor kasoo horjeedka tiro kastoo lagu siiyey :

(b) 7 (t) -5 (j) $-(-4)$

(x) -29 (kh) 146 (d) $-(-89)$

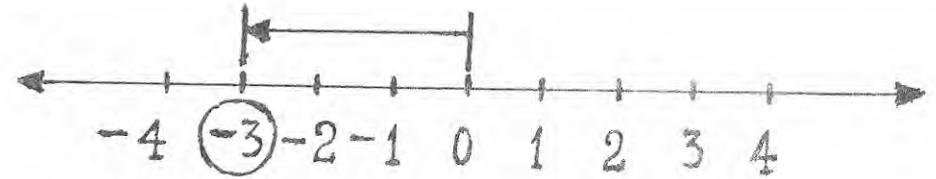
1. Isugeynta Abyooneyaasha

Hore waxaynu u soo aragnay isugeynta abyooneyaasha aan tabnayn (tirooyin idil). Isugeynta abyooneyaashoo dhammi waxba kama duwana taa tirsiiimo, hab ahaan markaynu adeegsanno xarriiqda tirada. Meeshii aynu oran jiray midig u soco uum baynu oran xagga jihada togan. Wadarta 3 iyo 2 waxay tahay:



Bal hadda, eeg sidaynu ugu muujinno -3 xarriiqda tirada. Waxaad xusuusan tahay in -3 tahay kasoo horjeedka 3. Taasina waxay ka dhigan tahay in -3 ay eber u jirto fogaan leeg taa 3, ee se jihada kasoo horjeedda (taban).

Eeg jaantuska hoose sida -3 loogu muujiyey.



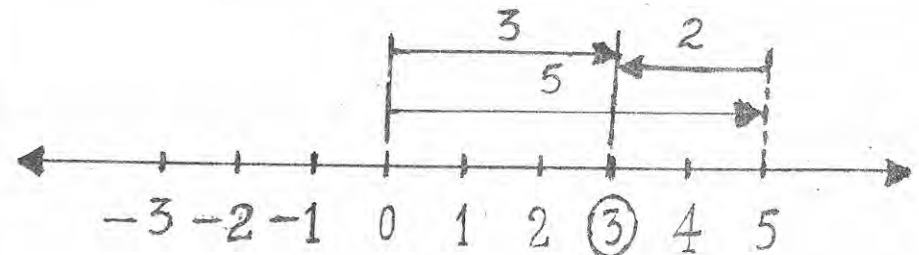
Innagoo hadda aragnay sida tirooyinka taban loogu muujiyo xarriiqda tirada, bal aan sameyno dhawr tusaale oo isu-geyn ah :

Tusaale b :

$$5 + (-2).$$

Furfuris :

Ka bilaw socodka eber ilaa shan docda jihada togan, dabadeedna 2 tallaabo u soco jihada kasoo horjeedda (taban). Haddaba, $5 + (-2) = 3$ sida lagu muujiyey jaantuska.

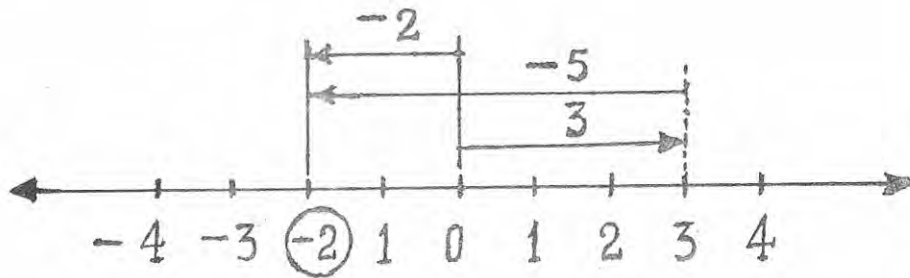


Tusaale t :

$$3 + (-5)$$

Furfuris :

Habka loogu muujinayo xarriiqda tirada waxba kama duwana kaa tusaalaha hore. Dhecho jaantuska.



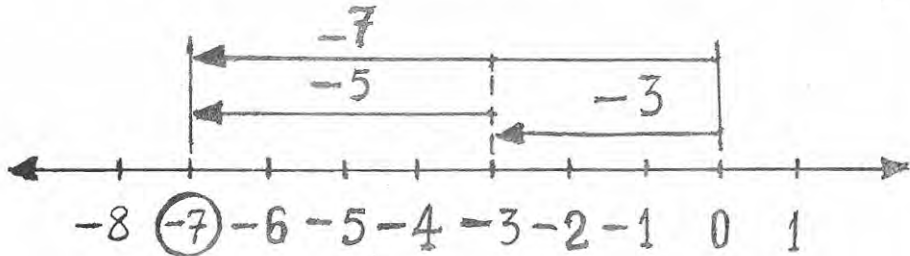
Haddaba, $3 + (-5) = -2$

Tusaale j:

$$(-3) + (-4)$$

Furfuris :

Ka bilaw socodka eber. 3 tallaabo xagga jihada taban u qaad, dabadeedna 4 tallaabo geestii uun u sii qaad. Dhugo jaantuska hoose. Halkeed gaadhay?

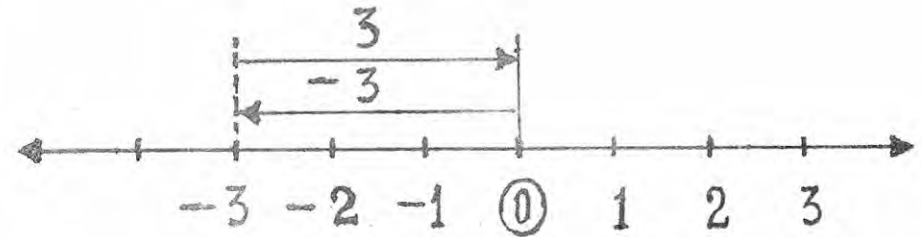


Tusaale x :

$$(-3) + 3$$

Furfusir :

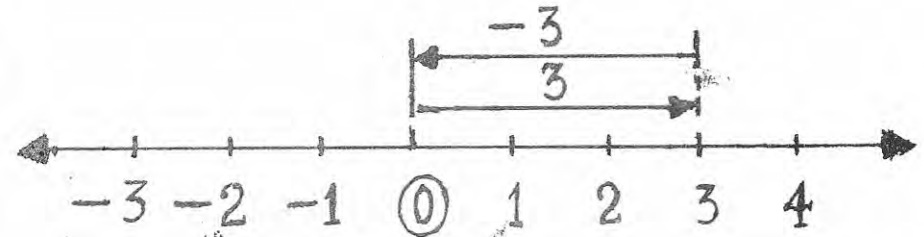
Sidii kuwii horoo kale ka bilaw eber. 3 tallaabo jihada taban u qaad, haddana 3 tallaabo oo kale jihada togan u qaad. Halkeed taagan tahay? Bal eeg jaantuska. Eber ma taagan tahay?



Waxaynu ku soo noqonay halkaynu socodka ka bilawnay oo ahayd eber. Taasi waxa weeye $(-3) + 3 = 0$.

Maxaad oran lahayd wadarta $3 + (-3)$?

Halka socodku ku dhammaaday iyo halkuu kii hore ku dhammaaday ma waxbaa u dhaxeeya? Sawirku ma ka duwan yahay kii hore. Bal eeg jaantuska hoose :



Tusaalahan waxa innooga muuqda laba astaamood oo ay tirooyinka abyoonayaashu leeyihiin.

1. Waxaan aragnay hubaasha $(-3) + 3 = 0$ ama $3 + (-3) = 0$. Taasi waxay tahay wadarta abyoone kasta iyo kasoo horjeedkiisu waa eber. Hubaashan waxa la yiraa **ASTAANTA WEYDAARKA ISUGEYNTA**. Lammaanihii iska soo horjeeday, hadda waxaynu oran waa isweydaar, oo midba ka kale wuxuu u yahay weydaarka isugeynta.

Haddaba, astaanta weydaarku waxay sheegtaa jiritaanka abyoone $(-b)$ oo ah weydaarka isugeynta ee abyoonaha (b) , taasoo ah :

$$b + (-b) = 0$$

2. Waxaynu aragnaa in $(-3) + 3$ iyo $3 + (-3)$ labadooduba magacyo kale ay u yihiin tirada eber. Kolkaa waxaynu oran :

$$3 + (-3) = (-3) + 3 = 0$$

Taasi waxay inoo sheegeysaa in sidii tirooyinka tirsiiimo, tirooyinka abyoone ay iyaguna isugeynta kala hormaraan. Si kale waxaynu u oran, abyooneyaashu waxay oggol yihiin astaantii kala hormarinta Isugeynta ee tirooyinka tirsiiimo.

2. Astaamaha Abyooneyaasha ee Isugeynta.

Sidii tirooyinka tirsiiimo ayaa abyooneyaashana isugeyntoodu ay leedahay astaamo u gaar ah. Innagoon si tafaftiran uga baaxaa degayn, si kooban uun baynu u sheegi.

Haddii b , t iyo j abyooneyaal yihiin markaa :

- $b + t = t + b$: Xeerka kala hormarinta isugeynta
- $(b + t) + j = b + (t + j)$: Xeerka Hormogelinta Isugeynta
- $b + 0 = 0 + b = b$: Xeerka Asal Madoorshaha Isugeynta
- $b + (-b) = (-b) + b = 0$: Xeerka Weydaarka Isugeynta
- Abyooneyaashu way ku oodmaan Isugeynta (wadarta laba abyoono kastaa waa abyoone kale).

Astaamaha waxa la adeegsan karaa marka abyooneyaasha laysu geynaayo iyadoon la isticmaalin xarriiqda tirada. Waxa kale oo aynu astaamaha ku ladhi dib u magacaabid tiro.

Taasi waxa weeye inagoo tiro ku beddelna mid kale oo la mid ah. Asto ahaan, magacyo kale oo ay leedahay innagoo ka fiirinayna docda Isugeyntoo qudh ah, bal dheeho tusaalooyinka so socda :

Tusaale 1 :

Isugee 7 iyo (-5)

Furfuris :

- $7 + (-5) = (2 + 5) + (-5)$ Dib u magacaabid
- $(2 + 5) + (-5) = 2 + [5 + (-5)]$ Hormogelinta Isugeynta
- $2 + [5 + (-5)] = 2 + 0$ Weydaarka Isugeynta
- $2 + 0 = 2$ Asal madoorshaha Isugeynta
- Sidaa awgeed $7 + (-5) = 2$.

Tusaale 2 :

Isugee (-8) iyo 3

Furfuris :

- $(-8) + 3 = [(-5) + (-3)] + 3$ Dib u magacaabid:
- $[(-5) + (-3)] + 3 = (-5) + [(-3) + 3]$ Hormogelinta isugeynta :
- $(-5) + [(-3) + 3] = (-5) + 0$ Weydaarka Isugeynta :
- $(-5) + 0 = (-5)$ Asal Madoorshaha Isugeynta :
- Sidaa awgeed $(-8) + 3 = (-5)$

Gabagabayn :

- Haddii laba tiro ay **togan yihiin**, wadartoodu way **togan tahay**.

- Haddii laba tiro ay **taban yihiin** wadartoodu way **taban tahay**.
- Haddii laba tiro **mid** **togan tahay**, midina **taban tahay**, fogaanta ay eber u kala jiraan ayaa **sugta toгнаanta** ama **tabnaanta** wadartooda.

Laylisyo :

- Sheeg in wadarta tirooyinka soo socda ay **togan**, **taban** ama eber tahay? Waayana?

| | |
|--------------------|------------------|
| (b) $(-8) + (-12)$ | (t) $(-11) + 11$ |
| (j) $54 + 21$ | (x) $(-18) + 15$ |
| (kh) $50 + (-1)$ | (d) $(-11) + 50$ |
- Ku muuji wadarta tirooyinkan xarriiqda tirada.

| | |
|-----------------|-------------------|
| (b) $8 + (-3)$ | (t) $5 + 7$ |
| (j) $(-4) + 9$ | (x) $(-8) + (-4)$ |
| (kh) $(-5) + 5$ | (d) $(-7) + (-7)$ |
- Raadi wadarta tirooyinkan adoo cuskanaaya xeerarka abyooneyaasha ee isugeynta.

| | |
|------------------|------------------|
| (b) $12 + (-8)$ | (t) $(-10) + 7$ |
| (j) $46 + (-39)$ | (x) $(-17) + 11$ |
| (kh) $50 + (-1)$ | (d) $(-11) + 50$ |

3. Kala Goynta Abyooneyaasha.

Kala goyntu waa weydaarka xisaabfalka isugeynta. Taa waxaynu ugajeednaa in ka goynta tiro ay dib u fasho, ama sameyso, u geynta tiro. Astaanta weydaarka ee xisaab falladan ayaa inoo oggol inaynu u qorno isugeynahan soo socda mid kastoo goyn ah.

$$7 - 3 = 4 \text{ iyo } 4 + 3 = 7$$

$$12 - 3 = 9 \text{ iyo } 9 + 3 = 12$$

$$56 - 20 = 36 \text{ iyo } 36 + 20 = 56$$

Waxan rabnaa inay isugeynta iyo kala goyntu abyooneyaashana u ahaadaan weydaarro xisaab fal. Taasi waxa weeye, haddii $7 - (-3) = n$ markaa $n + (-3) = 7$. Si aynu u furfurno kala goyn waxaynu sameyn karnaa isugeyn. n ma le'eg tahay toban?

$$7 - (-3) = 10 \text{ iyo } 10 - 3 = 7$$

Bal fiirso tusaalooyinkan, iskuna day inaad baadho sida kala goyn kastaa ay ula xiriirsan tahay isugeynta la socota :

$$3 - 8 = -5 \quad \text{iyo} \quad 3 + (-8) = -5$$

$$15 - 6 = 9 \quad \text{iyo} \quad 15 + (-6) = 9$$

$$5 - (-12) = 17 \quad \text{iyo} \quad 5 + 12 = 17$$

$$(-6) - 13 = -19 \quad \text{iyo} \quad (-6) + (-13) = -19$$

$$(-8) - (-11) = 3 \quad \text{iyo} \quad (-8) + 11 = 3$$

U rogga kala goyn kasta isugeynta la xiriirsan waxaynu ku isticmaali kasoo horjeedka la gooyaha. Taasi waa, inaynu tusaalaha hore u geeynay (-8) saddexda (3) halkii aynu 8 ka goyn lahayn 3 da. Tusaalooyinkaasi waxay wax ka iftiin qeexda kala goynta ee Abyooneyaasha.

Qeex :

Ka goynta abyoone waxay la mid tahay u geynta kasoo horjeedkiisa: Haddii b iyo t abyooneyaal yihiin waxaynu qeexda u dejin sidan :

$$b - t = b + (-t) \text{ kasoo horjeedka } t$$

Bal tusaalooyinkan eeg :

$$\begin{aligned} 4 - 15 &= 4 + (-15) \\ (-8) - 11 &= (-8) + (-11) \\ 3 - (-5) &= 3 + 5 \\ (-6) - (-9) &= -6 + 9 \end{aligned}$$

Fiiro sida qeexda kala goynta loogu adeegsaday tusaalahaan hoose :

$$\begin{aligned} n &= (-18) - (-75) \\ &= (-18) + 75 \\ n &= 57 \end{aligned}$$

Kala goyntu inkastoo ay tahay weydaarka isugeynta hadana xeerarka abyoonayaasha ee isugeynta mid uun bay u hoogaansantaa. Kaasi waxa weeye inay abyoonayaashu kala goynta ku oodmaan. Ha illoobin tirooyinkii tirsiiimo inayna ku oodmi jirin kala goynta.

Laylisyo :

Adeegso qeexda kala goynta si aad u hesho qiimaha n ee mid kastoo kuwan soo socda ah.

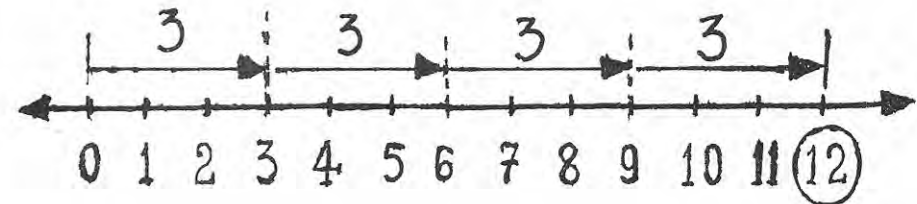
Tusaale :

$$\begin{aligned} n &= 5 - 2 \\ n &= 5 + (-2) \\ \therefore n &= 3 \end{aligned}$$

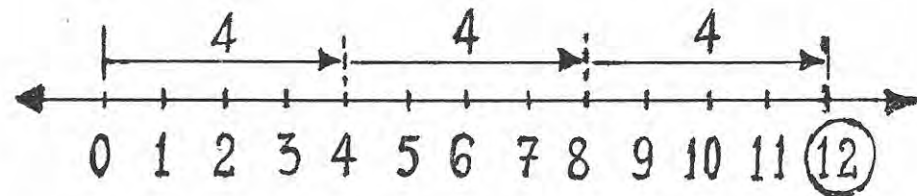
- | | |
|-----------------------|------------------------|
| 1) $n = 31 - 17$ | 2) $n = 46 - 120$ |
| 3) $n = 37 - (-9)$ | 4) $n = 41 - (-82)$ |
| 5) $n = (-11) - (-7)$ | 6) $n = (-24) - (-67)$ |
| 7) $n = 38 - (-38)$ | 8) $n = 0 - (-91)$ |
| 9) $n = 38 - 38$ | 10) $n = 0 - 91$ |

4. Isku dhufashada iyo xarriiqda tirada.

Ugu horrayntii, waxaynu ogsoonnahay inay Iskudhufashadu tahay isugeyn la soo celceliyey. Iskudhufashada waxa hawl yaraan looga arki karaa xarriiqda tirada. Haddii aad eegto 4×3 waxaad arkaysaa inay la mid tahay adoo afar goor booday oo ay booddadiiba tahay saddex. Kolkaa waxaad gaadheysaa 12. Eeg Jaantuska hoose.



Jaantuskan kale wuxuu muujinayaa 3×4 , oo ah saddex booddo oo booddadiiba tahay afar.

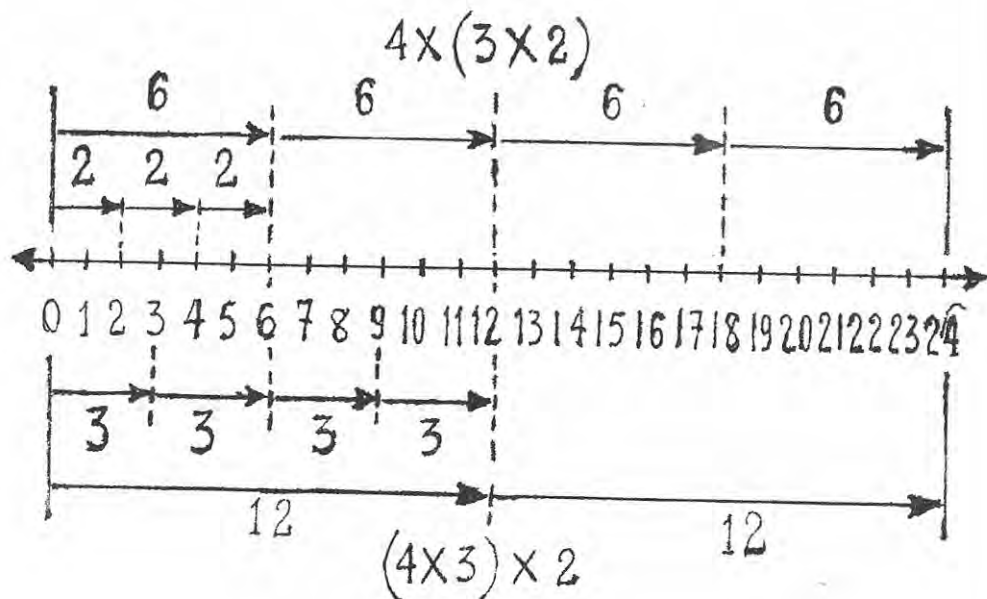


Labada jaantus waxay inna tusayaan xeerkaa kala hormarinta tirooyinka tirsiiimo ee isku dhufashada :

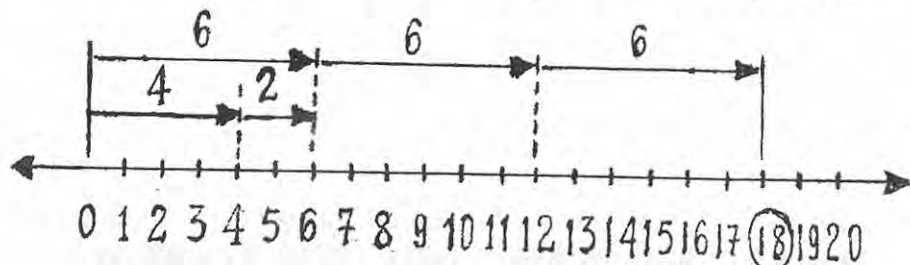
$$4 \times 3 = 3 \times 4$$

Imika aynu isku dayno in aynu sawirro $4 \times (3 \times 2)$ iyo $(4 \times 3) \times 2$. Ta hore waxay la mid tahay afar booddo oo saddex goor markiiba laba la tallaabsanayo, waxayna ku gaarsiinaysaa 24. Ta labaadna waxay la mid tahay afar jeer oo min saddex ah oo laba goor la booday. Taasina waxay ku geynaysaa 24. Eeg jaantuska hoose sida $4 \times (3 \times 2)$ iyo

$(4 \times 3) \times 2$ labadoodaba loogu muujiyey xarriiqda tirada kor iyo hoosteeda siday u kala horreeyaan.

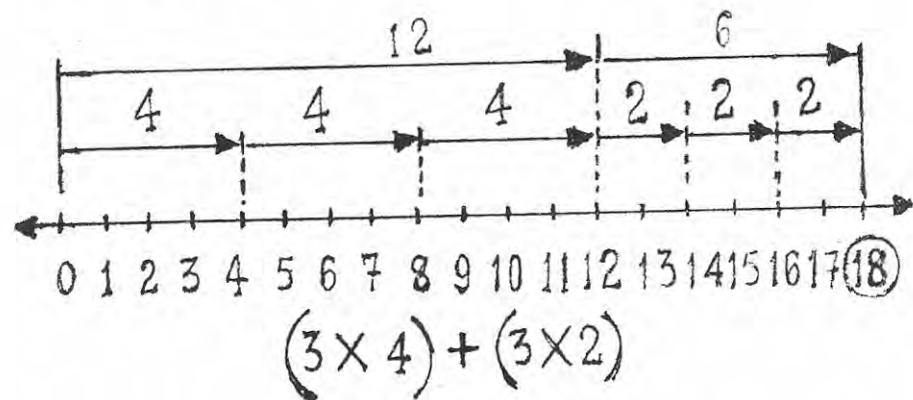


Kolkaa $4 \times (3 \times 2) = (4 \times 3) \times 2$
 Taasina waa xeerkaa hormogelinta tirada tirsiiimo ee iskudhufashada. Hadda, bal aynu ku muujinno xarriiqda tirada isku dhufashada $3 \times (4 + 2)$. Sidii aynu hore u soo baranay $4 + 2$ waxay ku geynaysaa 6. Markaana haddaad saddex goor booddo oo ay markiiba 6 tahay waxaad gaaraysaa 18.



Haddana $(3 \times 4) + (3 \times 2)$ aynu ku muujinno xarriiqda tirada. Tani waxay la mid tahay 3 booddo oo min afar

ah oo ay raaceen saddex booddo oo min laba ah. Intaasina waxay ku geynaysaa 18. Jaantuska hoose eeg.



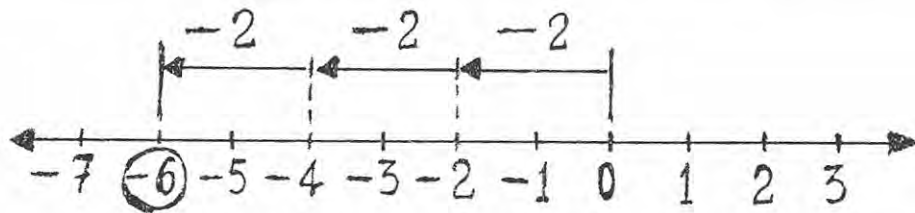
Kolkaa waxaynu labada jaantus ku soo gabagabyn in $3 \times (4 + 2) = (3 \times 4) + (3 \times 2)$. Taasina waxay ahayd xeerkaa kala dhigga ee tirooyin tirsiiimo.

5. Iskudhufashada Abyooneyaasha.

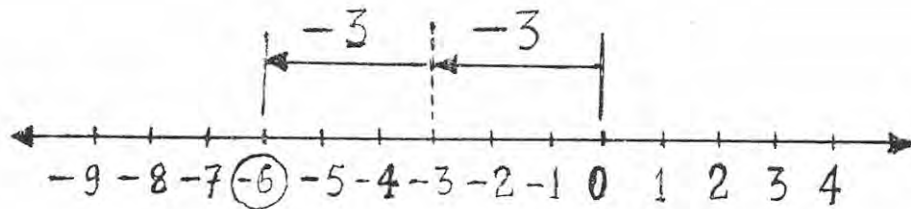
Hore waxaynu u niri tirooyinka tirsiiimo iyo abyooneyaasha togan waxba uma dhexeeyaan astada toгнаanta mooyaane, oo iyana qoriddeeda la iska dhaafo. Haddaba si ay labadoodu isku dhaqan u ahaadaan waa in abyooneyaasha togani oggolaadaan astaamihii isku dhufashada ee tirooyinka tirsiiimo. Taasina waxa weeye mar haddii $4 \times 5 = 20$ waxaynu rabnaa in $(+4) \times (+5) = +20$. Taasina waxay ka mid tahay qeexaha aynu rabno qaarkood.

Inta qur ah ee aynu u baahannahay waa inaynu tusno taranta laba tiro oo midi togan tahay midina taban tahay iyo laba tiro oo labadooduba ay taban yihiin.

Hore waxaynu u niri iskudhufasho waa isugeyn la soo celceliyey. Mar haddii 3×2 ay la mid tahay $2 + 2 + 2$; markaa, $3 \times (-2)$ waa inay la mid noqotaa $(-2) + (-2) + (-2)$ ama -6 . Tan dambe, haddaan ku muujinno xarriiqda tirada, waxay la mid tahay saddex goor oo aad boodday oo markii-ba laba bidix loo boodo. Eeg jaantuska.



Maxaad u malayn $(-2) \times 3$. Intii hore ma leeg tahay? Hadday le'ekaato xeerkee bay waafajisan tahay? Tarantu ma togan tahay mise waa taban tahay?

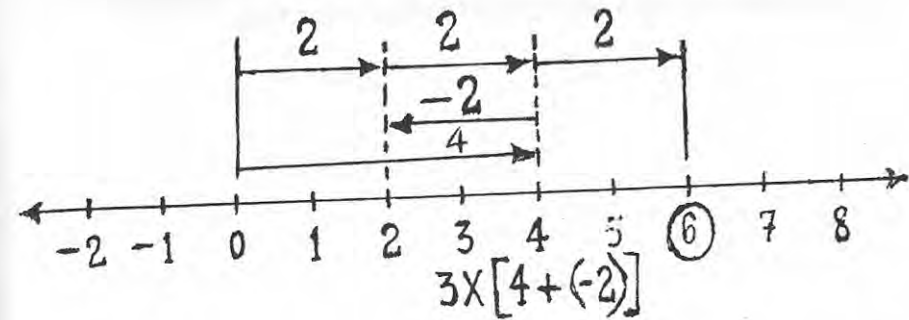


Si aynu u aragno jawaabaha su'aalaha, aynu ku muujinno $(-2) \times 3$ xarriiqda tirada. $(-2) \times 3$ waxay la mid tahay laba booddo oo bidix ah oo ay middiiba saddex tahay.

Kolkaa, labada jaantus ee sare waxay ina tusayaan in $3 \times (-2) = (-2) \times 3$, oo ah xeerka kala hormarinta. Haddaba waxaynu oran iskudhufashada abyoonayaashu way kala hormartaa.

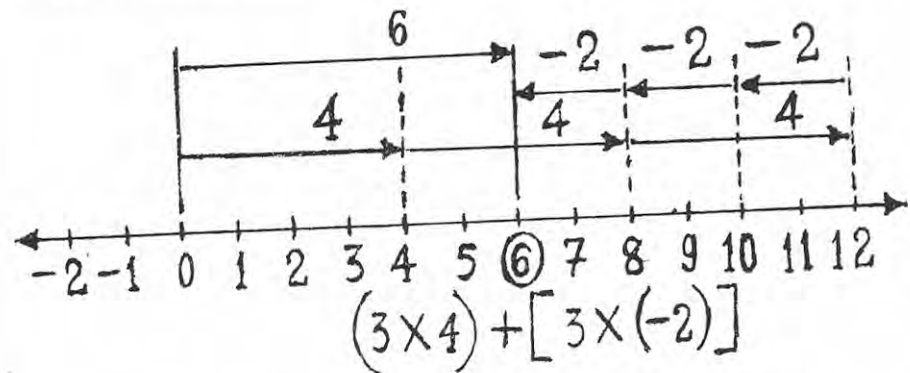
Haddaba, bal aynu xarriiqda tirada ku muujinno tarannadan (i) $3 \times [4 + (-2)]$ iyo (ii) $(3 \times 4) + [3 \times (-2)]$.

Ta hore, $4 + (-2)$ waxay tahay afar midig loo socday hadana laba bidix loo socday. Intaasi waxay ku gaarsiinaysaa laba midig ah. Dabadeedna 3×2 waxay tahay saddex booddo oo min laba ah. Intanna waxay ku gaarsiin 6. Eeg jaantuska hoose.



Ta labaad, $(3 \times 4) + [3 \times (-2)]$ waxay tahay saddex

booddo oo min afar ah oo ay raaceen saddex booddo oo min laba bidix u bood ah. Intaasi waxay ku gaarsiinaysaa 6. Eeg jaantuska hoose.



Labada jaantus ee sare, waxay ina garansiiyaan in $3 \times [4 + (-2)] = (3 \times 4) + [3 \times (-2)]$. Taasina waxay ahayd xeerkaa kala dhigga. Haddaba, waxaynu oran tirooyin abyooni way oggol yihiin xeerka kala dhigga isugeynta ee iskudhufashada.

Mar hadday isku dhufashada abyoonayaashu ay oggoshahay xeerka kala dhigga, waxaynu kow (1) ka dhigi asal ma-doorshaha abyoonayaasha ee iskudhufashada. Sidii tiroo-

yinka tirsiimo taranta abyoone iyo eber waa eber.

Taranta abyoone togan iyo mid tabani ma taban tahay? Si aad taa uga jawaabtid bal dhecho hannaanka sifaalahan, adoo waliba xusuusanaya ururkii dhufsanayaasha 3.

$$\{0, 3, 6, 9, 12, \dots\}$$

Dhufsana walba oo ururkaa ka mid ah, oo aan eber ahayn waxa lagu heli karaa iyadoo midba ka horeeya loo geeyo saddex.

$$3 \times 3 = 9$$

$$3 \times 2 = 6$$

$$3 \times 1 = 3$$

$$3 \times 0 = 0$$

Ma garan kartaa waxaynu ku xigsiin si aynu u sii wadno hannaanka sifaalaha? Sidan bay noqon :

$$3 \times (-1) = -3$$

$$3 \times (-2) = -6$$

$$3 \times (-3) = -9$$

Sow sidaa u ma sii wadi kartid?

Hore waxaynu u tilmaanay in iskudhufashada abyoone-yaashu ay kala Hormarto.

Markaa, $3 \times (-2)$ waxay magac kale u tahay tirada ay $(-2) \times 3$ magacowday. Haddaba, waxa muuqata in taranta abyoone togan iyo abyoone tabani, si kasta how kala hormaaraane, ay tahay abyoone taban. Si kale ayaynu arrintaas u muujin karnaa haddaynu isticmaalno xeerarka isweydaarka isugeynta iyo kala dhigga isugeynta ee isku dhufashada.

Tusaale :

$$2 \times 0 = 0$$

1. Eber ku beddel tiro iyo weydaarkeed.

Ka soo qaad 3 iyo (-3) . Markaa :

$$2 \times [3 + (-3)] = 0$$

2. Isticmaal xeerka kala dhigga isugeynta ee iskudshada :

$$[2 \times 3] + [2 \times (-3)] = 0$$

Mar haddii wadarta 2×3 iyo $2 \times (-3)$ ay eber tahay, kolkaa 2×3 iyo $2 \times (-3)$ waa inay isu noqdaan weydaarra-da isugeynta. Waxa kaloon oran karnaa,

$$2 \times (-3) = -(2 \times 3) = -6.$$

Hadda, ayaynu helnay jawaabtii su'aasha, waxaana weeye : «**Taranta abyoone togan iyo mid taban, si kasta ha loo kala hormarshee, waa weydaarka isugeynta kasoo horjeedka taranta labada abyoone oo wada togan**».

Ilaa hadda waxaynu soo aragnay taranta laba abyoone oo togan iyo laba mid togan yahay midna taban yahay. Maxaad u malayni taranta laba abyoone oo taban? Ma taban tahay mise waa togan tahay?

Hore waxaynu u aragnay $3 \times (-3) = -9$. Astaanta kala hormarintuna waxay inoo oggolaatay :

$$3 \times (-3) = (-3) \times (3) = -9.$$

Haddaba bal eeg hannaan-sifaalahan soo socda :

$$(-3) \times 3 = -9$$

$$(-3) \times 2 = -6$$

$$(-3) \times 1 = -3$$

$$(-3) \times 0 = 0$$

Maxaad ku xigiin lahayd si hannaan-sifaalahani uu u si socdo? Sidan bay noqon doontaa :

$$(-3) \times (-1) = 3$$

$$(-3) \times (-2) = 6$$

$$(-3) \times (-3) = 9$$

Sidaa awgeed waxa inoo muuqata in taranta laba abyoone oo tabani ay tahay abyoone togan. Si kale arrintan waa loo muujin karaa haddii la isticmaalo xeerarka isweydaarka isugeynta iyo kala dhigga isugeynta ee iskudhufashada.

Tusaale :

$$(-3) \times 0 = 0$$

1. Eber ku beddel wadarta Abyoone iyo weydaarkiisa. Ka soo qaad $4 + (-4)$. Markaa

$$(-3) \times [4 + (-4)] = 0$$

2. Isticmaal xeerka kala dhigga :

$$(-3) \times [4 + (-4)] = [(-3) \times 4] + [(-3) \times (-4)] = 0$$

$$= -(3 \times 4) + [(-3) \times (-4)] = 0$$

$$= -12 + [(-3) \times (-4)] = 0.$$

Mar hadday wadarta $-(3 \times 4)$ iyo $(-3) \times (-4)$ ay

eber tahay, -12 iyo $[(-3) \times (-4)]$ waa inay isu noqdaa weydaarrada isugeynta.

Si kale waxaynu oran $(-3) \times (-4) = 12$.

Hadda, ayaynu helnay jawaabtii su'aasha oo ah:

«Taranta laba abyoone oo tabani waxay la mid tahay tarantooda markay labaduba togan yihiin».

ASTAAMAHA ABYOONEYAASHA EE ISKUDHUFASHO

1. Abyooneyaashu way ku oodmaan iskudhufashada.
2. Abyooneyaashu way kala hormaraan iskudhufashada.

$$b \times t = t \times b$$

3. Abyooneyaashu way hormogalaan iskudhufashada.

$$(b \times t) \times j = b \times (t \times j)$$

4. Abyoonaha kow (1) waa asal madoorshaha iskudhufashada.

$$b \times 1 = 1 \times b = b$$

5. Abyooneyaashu way oggol yihiin xeerka kala dhigga isugeynta ee iskudhufashada.

$$b \times (t \times j) = (b \times t) + (b \times j)$$

Waxa kaloo jirta in ku dhufasho abyoone ay kala dhigto kala goynta abyooneyaasha.

Tusaale ahaan :

$$2 \times (3 - 4) = 2 \times (-1) = -2$$

$$(2 \times 3) - (2 \times 4) = 6 - 8 = -2$$

Markaa

$$2 \times (3 - 4) = (2 \times 3) - (2 \times 4)$$

Iyana :

$$(-3) \times [(-3) - 4] = (-3) \times (-7) = 21$$

$$\left\{ (-3) \times (-3) \right\} - \left\{ (-3) \times 4 \right\} = 9 - (-12) = 21$$

Markaa,

$$(-3) \times \left[(-3) - 4 \right] = (-3) \times (-3) - \left[(-3) \times 4 \right]$$

Sidaa waxa inoo oggolaaday ama ina gaarsiiyey qeexiddii kala goynta. Waxaynu niri kala goyntu waa weydaarka xisaabfalka isugeynta, markaana ka goynta abyoone waxay la mid tahay u geynta weydaarka isugeynta (kasoo horjeedka) abyoone; waa sida $3 - 4 = 3 + (-4)$

Gooni ahaan waxaynu xeerkan u bixin kala dhigga kala goynta ee iskudhufashada :

$$b \times (t - j) = (b \times t) - (b \times j)$$

Waayo :

1. Taranta abyooneyaashani ma togan tahay mise waa taban tahay? Waayo?

- (b) $3 +$ (t) $(-b) \times 3$ (j) $(-1) \times 6$
 (k) $(-6) \times 3$ (kh) $5 \times (-4)$ (d) $(-8) \times (-7)$
 (r) 3×0 (s) $(-3) \times 0$ (sh) $(-11) \times (4 - 3)$

2. Raadi taranta abyooneyaashan :

- (i) 16×2 (t) $(-3) \times 8$ (j) $(-8) \times 3$
 x) $(-4) \times (-5)$ kh) $4 + (-3) + 6$ d) $(-3) + 4 + (-5)$

3. Raadi qiimaha n.

- b) $n = 6 \times 9$ (t) $n = (-3) \times 18$
 j) $n = 3 \times 2 + (-2)$ x) $n = 3 \times (18 - 2)$
 kh) $n = 4 \times 2 + 16$ d) $n = (3 \times 6) + 3 \times (-2)$

4. Waxaad ku muujisaa xarriiqda tirada xeerarka isku dhufashada abyooneyaasha oo ah.

- b) Kala hormarinta
 t) Hormogelinta
 j) Kala dhigga isugeynta
 x) Asal madoorshe

1. Isuqaybinta Abyooneyaasha.

Waxaynu naqaannaa sida laba tiro laysugu qayqbiyo. Waxa kaloo aynu ogsoon nayahay in isuqaybintu ay tahay weydaarka xisaabfalka ee iskudhufashada. Taasi waxa weeye u qaybinta 8 waa weydaarka ku dhufashada 8.

Fiiro tusaalooyinka si aad isugu daydo inaad hesho darriiqda aad isugu qaybiso abyooneyaasha :

- b) $(+15) \div (+3)$, taasi waxa weeye : Maxaa lagu dhuftaa $+3$ si aad u hesho $+15$? Tan waxaynu u qori karnaa $n \times (+3) = +15$. Mar haddii $(+5) \times (+3) = +15$, waxaynu ognahay in $n = +5$.
- t) $(+18) \div (-3)$, taasi waxa weeye : Maxaa lagu dhuftaa (-3) si aad u hesho $(+18)$? Tan waxaynu u qori karnaa $n \times (-3) = +18$. Mar haddii : $(-6) \times (-3) = +18$, waxaynu ognahay in $n = -6$.
- j) $(-24) \div (+6)$, taasi waxa weeye : Maxaa lagu dhuftaa $(+6)$ si aad u hesho (-24) ? Tan waxaynu u qori karnaa $n \times (+6) = (-24)$. Mar haddii : $(-4) \times (+6) = (-24)$, waxaynu ognahay in $n = -4$.
- x) $(-36) \div (-4)$, taasi waxa weeye : Maxaa lagu dhuftaa (-4) si aad u hesho (-36) ? Tani waxaynu u qori karnaa $n \times (-4) = (-36)$. Mar haddii : $(+9) \times (-4) = (-36)$, waxaynu ognahay in $n = (+9)$.

Tusaalaha «b», wuxuu muujinayaa in qaybta laba abyoone oo togani ay tiro togan tahay.

Tusaalooyinka «t» iyo «j» waxay muujiyaan in qaybta laba abyoone oo mid togan yahay ka kalena taban yahay ay tahay tiro taban.

Tusaalaha «x» wuxuu muujinayaa in qaybta laba abyoone oo tabani ay tahay tiro togan.

Su'aasha aynu isweydiin karraa waxay tahay, abyooneyaashu ma ku oodmaan isuqaybinta? Ujeeddada weydiintu waxa weeye marka laba abyoone oo kasta laysu qaybiyo tirada qayb ahaan loo helaa ma tahay abyoone? Si aynu arrintaa uga jawaabno, bal dheeho tusaalooyinkan :

- b) $6 \div 3$, iskudhufashada la xiriirtaa waxa weeye $n \times 3 = 6$. Markaana $n = 2$. Haddaba qaybtu waa 2, waana abyoone.
- t) $3 \div 6$. iskudhufashada la xiriirtaa waxa weeye, $n \times 6 = 3$. Ma jiraa abyoone marka 6 lagu dhuf-to tarantu noqonayso 3.
- j) $19 \div 2$, iskudhufashada la xiriirtaa waxa weeye $n \times 2 = 19$. Ma jiraa abyoone marka 2 lagu dhuf-to tarantu noqonayso 19.

Jawaabaha labada tusaale ee t iyo j waa maya. Taa-sina waxay tahay inaan abyooneyaashu ku oodmin isuqeybin-ta. Labada tusaale ee b iyo t iyana waxay sheegayaan inaan abyooneyaashu isuqaybinta kala hormarin.

Waxa halkaa ka muuqata in loo baahan yahay tirooyin kale si jawaab loogu helo labada tusaale ee t iyo j, iyo kuwa la mid ah. Intaynaan tirooyinka baran, bal aynu tirooyinkan abyooneyaasha ku soo gabagabayno xiriirkooda iyo xeerar-kooda xisaabfalka.

2. Astaamaha Abyooneyaasha iyo Xisaabfallada.

I. Oodan.

- b) Wadarta laba abyoone oo kastaa waa abyoone :
 $(b + t)$ waa abyoone.
- t) Faraqa laba abyoone oo kastaa waa abyoone :
 $(b - t)$ waa abyoone
- j) Taranta laba abyoone oo kastaa waa abyoone :
 $(b \times t)$ waa abyoone
- x) Qaybta laba abyoone oo kastaa ma aha abyoone, mar walba.

$(b \div t)$ ma aha abyoone, mar kasta.

II. Kala Hormarinta.

- b) Abyooneyaashu isugeynta way kala hormaraan :
 $b + t = t + b$
- t) Abyooneyaashu isku dhufashada way kala horma-raan : $b \times t = t \times b$
- j) Abyooneyaashu kala goynta ma kala hormaraan :
 $b - t \neq t - b$
(summaddani (\neq) waa astada «isma le'eka»)
- x) Abyooneyaashu isu qaybinta ma kala hormaraan :
 $b \div t \neq t \div b$

III. Hormogelinta.

- b) Abyooneyaashu isugeynta way hormogalaan :
 $(b + t) + j = b + (j + t)$

- t) Abyooneyaashu isku dhufashada way hormogalaan :
 $(b \times t) \times j = b \times (t \times j)$
- j) Abyooneyaashu kala goynta ma hormogalaan :
 $(b-t) - j \neq b - (t-j)$
- x) Abyooneyaashu isuqaybinta ma hormogalaan :
 $(b \div t) \div j \neq b \div (t \div j)$

IV. Asal Madoorshe.

- b) Asal madoorshaha isugeynta ee abyoone kastaa waa eber : $b+0 = 0+b = b$
- t) Asal madoorshaha iskudhufashada ee abyoone kastaa waa hal : $b \times 1 = 1 \times b = b$
- j) Kala goyntu ma oggola xeerka asal-madoorshaha. Eber waa asal madoorshaha kala goynta ee midigeed.
 $b-0 = b$ hase ahaatee
 $0-b \neq b$
- x) Isuqaybintu uma hogaansanto xeerka asal-madoorshaha. Hal (1) waa asal-madoorshaha isuqaybinta ee midigeed :
 $b \div 1 = b$ hase yeeshee
 $1 \div b \neq b$

V. Kala dhigga.

- b) Iskudhufashadu isugeynta way kala dhigtaa :
 $b \times (t+j) = (b \times t) + (b \times j)$
- t) Iskudhufashadu kala goynta way kala dhigtaa :
 $b \times (t-j) = (b \times t) - (b \times j)$
- j) Isuqaybintu isugeynta xagga midig bay ka kala dhigtaa, xagga bidixse maya :

$$(b+t) \div j = (b \div j) + (t \div j)$$

$$j \div (b+t) \neq (j \div b) + (j \div t)$$

- x) Isuqaybintu kala goynta xagga midig bay ka kala dhigtaa, xagga bidixse maya :
 $(b-t) \div j = (b \div j) - (t \div j)$
 $j \div (b-t) \neq (j \div b) - (j \div t)$

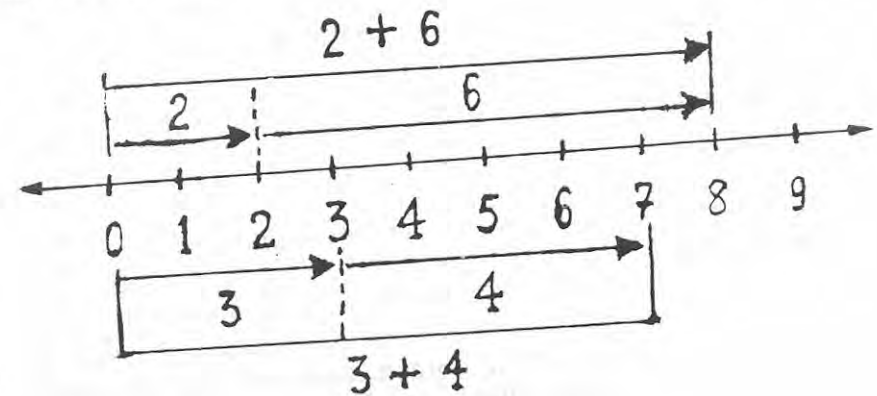
VI. Weydaarka isugeynta.

Abyoone kastaa wuxuu leeyahay abyoone kasoo horjeeda oo ay wadartoodu tahay eber (asal madoorshaha isugeynta) :

$$b + (-b) = (-b) + b = 0$$

ISGARAB DHIG

Waataynu aragnay sida laba tiro laysugu daro. Haddii aynu eegno $5+3$, xarriiqda tiradu waxay kutusaysaa inaynu gaarayno 8. Markaad eegto $1+7$ iyana waxay ku gaarsiinaysaa 8. Kolkaa waxaad oran kartaa $5+3$ waxay le'egtahay $1+7$. Isle'ekaanshadana astada aynu ku isticmaali jirnay waxay ahayd «=». Haddaad eegto $3-4$ iyo $2+6$ waxaad arkaysaa in ta hore ay ku gaarsiinayso 7, ta dambana ay ku gaarsiinayso 8. Waxaad arkaysaa inaanay $3+4$ le'ekayn $2+6$. Isma le'ekaanshadana astada aynu isticmaalinay waxay ahayd \neq .



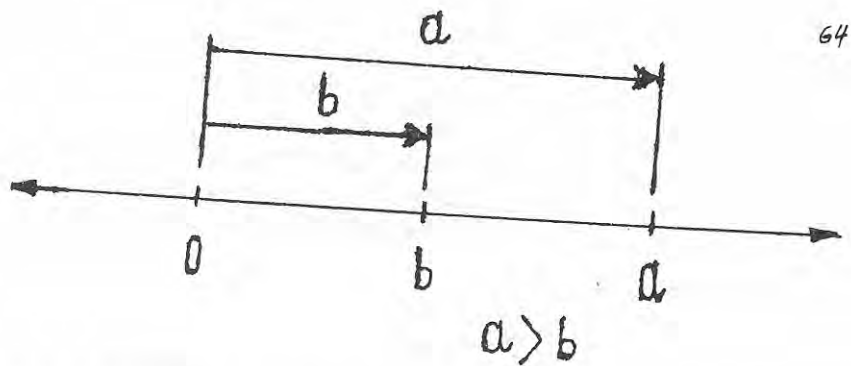
$$1+7 = 5+3 = 8$$

$$3+4 = 7, \quad 2+6 = 8 \quad 7 \neq 8$$

Markaad eegto xarriiqda tirada waxaad arkaysaa in 8 uu 7 ka xigo xagga midig. Waxaynu niraahnaa 8 way ka weyn tahay 7. Waxan u qornaa $8 > 7$. Astada $>$ waxay u taagan tahay «ka weyn». Xarriiqda tirada haddaad dib ugu noqoto, waxaad arkaysaa in 4 uu 5 xagga bidix ka xigo. Taas waxaynu niraahnaa 4 way ka yar tahay 5. Sida loo qoraana waa $4 < 5$. Astada $<$ waxay u taagantahay «ka yar». Ka weynaanta iyo ka yaraantana waxa laysku yidhaahaa «dheelli».

Qeex :

- Haddii a iyo b ay yihiin laba tiro, a way ka weyn tahay b (oo loo qoro $a > b$) waxay tahay a baa ka xigta b xagga midig.



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$a > b$ waxa kalood ku micnayn kartaa, $a - b > 0$.

Xusuus: 1) $a < b$ waxay la mid tahay $b > a$.

$a > b$ waxay la mid tahay $b < a$.

- $m \leq n$ waxay ka dhigan tahay m way ka yartahay ama le'egtahay n, $m \geq n$ waxay ka dhigan tahay m way ka weyn tahay ama le'eg tahay n.

Xarriiqda tirada haddaad sii eegtid waxaad arkaysaa tiro kastoo ah tiro diban inay bidix ka xigto tirada togan.

Tusaale 1 :

$-5 < 2$ waayo : -5 bidix buu ka xigaa 2.

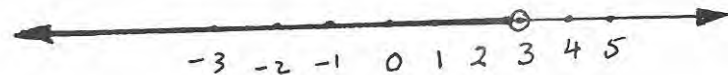
$-1000 < 1$ waayo : -1000 bidix buu ka xigaa 1.

Tusaale 2 :

Xarriiqda tirada waxaad ku muujisaa $a < 3$.

Xarriiqda dhumucda weyni waxay muujinaysaa inay a noqon karto halkii la doono ee xagga bidix ka xigta 3.

Goobaabinta 0 ee khafiifka ihina waxay ku tusaysaa inaynaan gaarayn 3.



Tusaale 3 :

Xarriiqda tirada ku muuji $a \geq 3$.

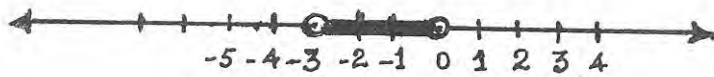
Goobaabinta \bullet w eyni waxay ku tusaysaa inay 3 ku jirto jawaabteena.



Haddii a ay ka yar tahay t oo t ka yar tahay b waxaynu qornaa $a < t < b$. Waxay la mid tahayna t waxay u dhaxaysaa a iyo b.

Tusaale 1 :

Xarriiqda tirada ku muuji $-3 < a < 0$.



Tusaale 2 :

Xarriiqda tirada ku muuji $-4 < t \leq 5$.



1. Astaamaha Isgarabdhigga.

1. Haddii a iyo b ay yihiin laba tiro, markaa $a < b$ ama $a = b$ ama $a > b$.
2. Haddii $a < b$ oo $b < t$, markaa $a < t$.
3. Haddii $a > b$ oo $b > t$, markaa $a > t$.
4. Haddii $a < b$ oo t ay tahay tiro, markaa $a + t < b + t$.
5. Haddii $a < b$ oo $t > 0$, markaa $a \cdot t < b \cdot t$.
6. Haddii $a < b$ oo $t < 0$, markaa $a \cdot t > b \cdot t$.

Tusaalooyin :

Haddii:

- i) $3 < 4$ oo $4 < 5$, kolkaa $3 < 5$
- ii) $6 > 3$ oo $3 > 2$, kolkaa $6 > 2$
- iii) $-7 < -2$, markaa
 $-7 + 5 = -2$; $-2 + 5 = 3$

Markaa $-2 < 3$ ama $-7 + 5 < -2 + 5$

- 2) Waxaad ogtahay in $4 > 3$, $2 > 0$,
kolkaa $4 \times 2 = 8 > 3 \times 2 = 6$.
- 3) Waxaad ogtahay in $5 < 6$ oo $-2 < 0$
kolkaa $-2 \times 5 = -10 > -2 \times 6 = -12$

Laylisyo :

Xarriiqda tirada waxad ku muujisaa :

- 1) $a > 4$
- 2) $b = 0$ ama $b = 1$
- 3) $t < -5$
- 4) $2 < a < 7$
- 5) $m \leq 7$
- 6) $-2 \leq n < 0$
- 7) $6 < k < -1$
- 8) $k = 2$ ama $k < -1$
- 9) $k > -2$

CUTUB VI

S A L A L K A

1. Sal 5, 2, 12.

Hadda waxaynu ogsoonnahay in sidaynu wax u tirinnaa ay tahay toban toban. Marka aad sii eegto waxaynu u jeedno kolka la leeyahay toban iyo afar, waxa kuu muuqanaya in loo jeedo meel toban ah, iyo afar midh. Sidoo kale soddon iyo lix waxa looga jeedaa saddex meelood oo toban toban ah iyo lix midh. Sidoo kale 124 waxay tahay toban oo toban ka kooban iyo laba koox oo toban ka kooban iyo afar midh. Waynu naqaanna tirooyinka caynkaas ah. Weliba waxaynu ogsoonnahay inay astaamo gooniya leeyihiin. Astaamahaa waxa ka mid ah hormagelinta, kala hormarinta isku dhufashada ama isugeynta iyo wixii la mid ah. Tirada ku xiran kooxo

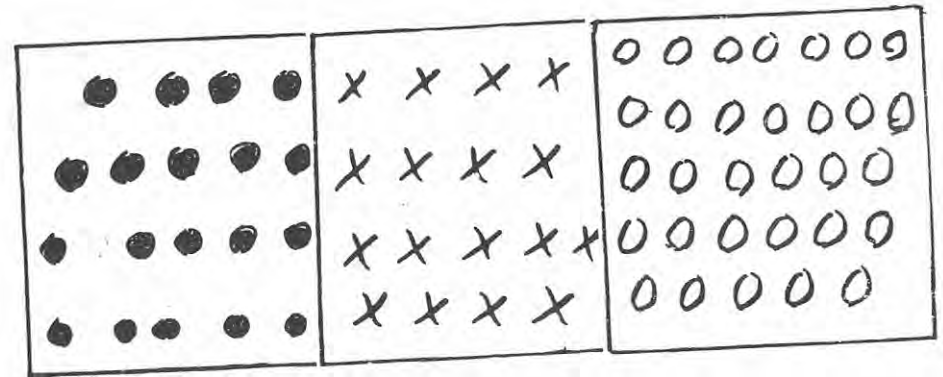
toban ah waxaynu nidhaahnaa waxay isticmaashaa Sal 10. Taa waxa looga jeedaa waxaynu ka hadlaynaa kooxo toban ah.

Sal 10 ma aha salka qudh ah ee la isticmaalo marka wax la tirinayo. Run ahaantii sal 10 waa ka ugu hawsha yar aadna loo isticmaalo. Mararka qaarkood waxa fiican in la isticmaalo salal kale. Hadda waxaynu arki doonnaa sida loo isticmaalo Sal 5, Sal 2 iyo Sal 12. Waxa kaloo aynu isku deyi doonnaa inaynu aragno in waxyaabaha u astaamaha ah isugeynta iyo iskudhufashada marka la qaato Sal 10 ay yihiin salalka kalena.

2. Sal Shan.

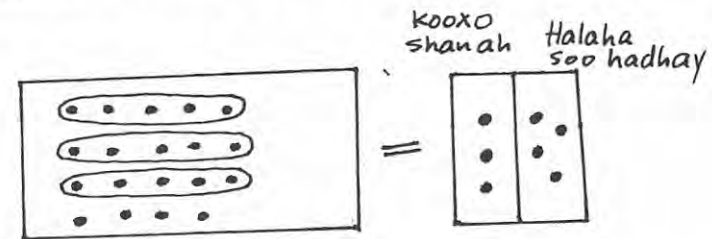
Ugu horrayntii waa inaynu garannaa waxaynu uga jeedno Sal. Sal waa tiro kooxo ah. Haddii aad sii eegto sidaynu wax u tirinno waxa kuu muuqanaya inay ku dhisan tahay kooxo toban ah. Kolkaynu leenahay 33 ujeeddadu waxa weeye waxaynu haysanaa saddex kooxood oo toban ka kooban iyo saddex midh. 124 iyana waa toban kooxood oo midiba tahay toban, iyo laba kooxood oo tiiba tahay toban, iyo afar midh. Kolkaa $124 = (10 \times 10) + (2 \times 10) + 4$.

Sidoo kale, marka sida wax loo tirinayaa ay ku xiran tahay Sal kale, habka tirsiimadaasi waxay ka kooban tahay kooxaha Salku ka sameysan yahay. Haddii aynu damacnay inaynu wax tirino, oo aynu rabno tiradeenu inay ahaato kooxo shan shan ah, waxaynu nidhaahnaa tiradeenu waxay ku xidhan tahay sal shan. Taasi waxay tahay kolka shan la gaadhaba waxa la xisaabiyaa koox. Taa qudheedu waxa weeye kolkii la helo koox Shan ahba waxa la xisaabiyaa koox qudh ah. Haddii aad hesho koox toban ka kooban, waxaad xisaabinaysa laba kooxood oo midiba tahay shan. Si ay u sii cadaato waxa loo jeedaa bal aan eegno jaantusyada hoos ku yaalla.



Waad aragtaa jaantusyadaasu in ay muujinayaan summado. Astooyinkaasi micna gaar ah loogama jeedo; waxa laga rabaa meesha ay ka muuqato waageerradu inay wax ku jiraan.

Jaantuska u horreeya haddaynu qaadanno oo summadaha aynu damacno in shan shan isugu qaadno, waxaynu helaynaa saddex kooxood oo midiba shan tahay iyo afar midh. Jaantuskuna wuxuu u ekaanayaa sidan :



Isu ururinta shan ka kooban waxa la yidhaahaa sal shan. Jaantuskeenna ka koobnaa 19 summadood kolka tiradii caadiga ahayd la raaco waxay imminka isu rogaysaa saddex kooxood oo shan shan ah iyo afar midh. Sida loo akhriyaana waxay tahay **saddex, afar, sal shan**; waxaana loo qoraa (34)5 iyaado looga jeedo saddex kooxood oo shan shan ah iyo afar midh.

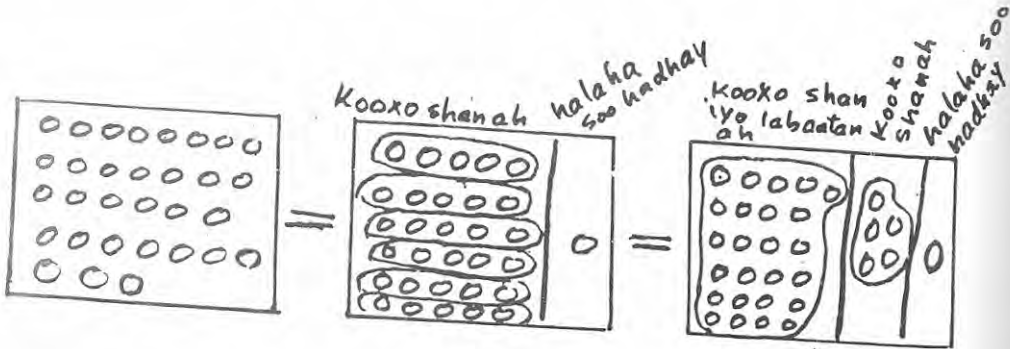
Jaantuska labaad haddaad isna eegtid, waxa kuu muuqanaya inaynu ka dhigi karno saddex meelood oo meeshiiba

tahay shan. Waxaana soo hadhaya laba midh.

Waxa kuu muuqata in summadihii isugu soo uru-reen saddex kooxood oo kooxdiiiba tahay shan iyo laba midh oo soo hadhay. Summadeheennii kolka waa saddex kooxood oo min shan ah iyo laba midh. Waxaynu u qoraynaana (35)₅ ujeeddadoo ah inaynu haysanno saddex meelood oo shan shan ka kooban iyo laba midh.

Jaantuska ugu dambeeya waxaad mooddaa inuu kuwaa kale ka yara duwanaan doono haddii shan shan laysugu qaado, waayo summadihiisa ayaa fara badan. Runtii si labada jaantus ee hore ka duwan aynu u ekaan doonaa. Si ay inoogu muuqato taasi, bal aan hoos u eegno isagana.

Kolka summadaha shan shan loo qaado, waxay noqonayaan lix kooxood oo midiba shan ka kooban tahay; midna waa soo hadhaya. Lixda kooxood ee tiiba tahay shan waxa laga dhigi karaa koox labaatan iyo shan ah iyo koox shan ah. Jaantuskii wuxu u ekaanayaa sidan :



Soddon iyo kowdii summadood markaa waxay ka koobmayaan koox labaatan iyo shan ah iyo koox hal ah iyo midh soo hadhaya. Waxaynu u akhriyaynaa «kow kow kow sal shan»; waxaynay u qormaysaa (111). Labada jaantus ee hore waxay ahaayeen laba laba god. Ta saddexaadse waxay noqotay saddex god.

Sidoo kale ayaa loo muujiyaa haddii afar ama shan god iwm., ay ahaan lahaayeen astooyinku.

Waxaynu aragnay inaynu summado shan shan u oodi karno. Fadanaase, summado kuma shaqayno ee waxaynu ku shaqeynaa tirooyin. Tirooyin keennuna waxay ka kooban yihiin sal toban. Waxa, markaa, lagama maarmaan ah inaynu tirooyin salkoodu yahay toban u rognu sal kale. Sidoo kale tiro salkeedu yahay wax kale waa in loo rogi karaa sal toban. Ka soo qaad inaynu damacnay 14 inaynu u rognu sal shan. Taasi waxay noqonaysaa inaynu eegno inta kooxood ee shan shan ah ee 14 ay noqonayso. Kooxaha aynu raadinayno waxa lagu heli karaa haddii 14 loo qaybiyo 5.

Kolkaa,

$$\begin{array}{r} 2 \text{ kooxood} \\ 5 \mid 14 \\ \quad 10 \\ \hline \quad 4 \text{ soo hadhay} \end{array}$$

Haddaba 14 sal toban waxay u dhigantaa (24)₅, waxaanay tahay 2 kooxood oo tiiba 5 tahay iyo 4 soo hadhay.

Tusaale :

49 waxaad u rogtaa sal shan.

Furfurid :

$$\begin{array}{r} 9 \text{ kooxood} \\ 5 \mid 49 \\ \quad 45 \\ \hline \quad 4 \text{ soo hadhay} \end{array}$$

Waxaynu arkaynaa in la helaayo 9 kooxood oo tiiba 5 tahay iyo 4 hadnaa ah. Waxa hadda suuragal ah in 9 laga sameyn karo kooxo shan ah.

$$\begin{array}{r} 1 \text{ koox} \\ 5 \overline{) 9} \\ \underline{5} \\ 4 \end{array}$$

49 kolkaa waxay noqonaysaa koox labaatan iyo shan ah iyo 4 kooxood oo shan ah iyo 4 midh.

$$\therefore (49)_{10} = (144)_5$$

Tusaale :

U rog sal shan $(130)_{10}$

$$\begin{array}{r} \text{Koox 26} \\ 5 \overline{) 130} \\ \underline{10} \\ 30 \\ \underline{30} \\ 0 \text{ soo hadhay} \end{array}$$

$$\begin{array}{r} 5 \text{ kooxood} \\ 5 \overline{) 26} \\ \underline{25} \\ 1 \text{ soo hadhay} \end{array}$$

$$\begin{array}{r} 1 \\ 5 \overline{) 5} \\ \underline{5} \\ 0 \text{ soo hadhay} \end{array}$$

$$\text{Kolkaa, } (130)_{10} = (1010)_5$$

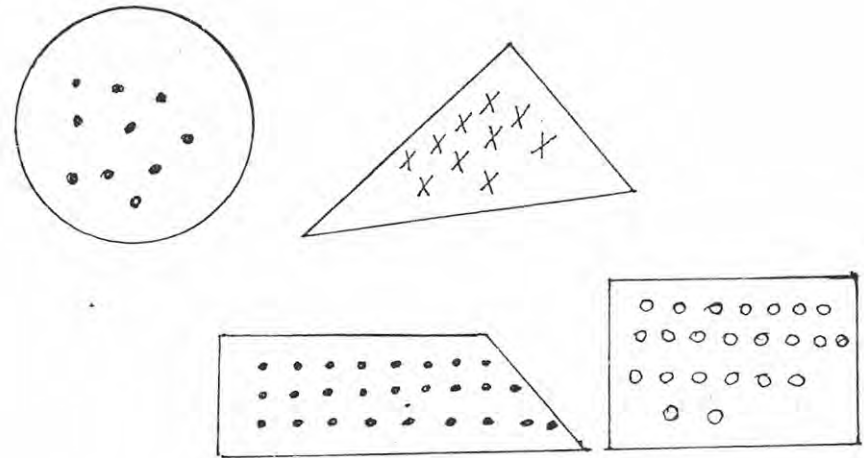
Ogcysiis : $(1010)_5$ waxay tahay koox 125 ah, koox madhan, koox shan ah iyo eber soo hadhay.

Layli :

A. Masalooyinka soo socda u rog sal shan :

- (1) 6 (2) 9 (3) 11 (4) 22
 (5) 37 (6) 46 (7) 128 (8) 105
 (9) 143 (10) 200

B. Jaantusyadan waxaad ku beddeshaa qaar u dhigma oo summadaha shan shan isugu qaadaya.



C. Jaantusyadaa kore waxaad u qortaa sal shan.

Tusaalooyinkaa kore iyo layliguba waxay ku tusayaan in marka tiro salkeedu yahay toban loo rogayo sal shan loo baahan yahay in tirada loo qaybiyo shan. Qaybtu haddii ay ka badato shan, shan baa haddana loo sii qaybinayaa. Sidaa ayaa lagu wadayaa ilaa ay qaybtu ka yaraato shan. Hayeeshee, intii qayb dheer la geli lahaa waxa la ogsoon yahay in $laqaybshe = (qaybshe \times qayb) + hadhaa$.

Haddii aynu raacno xidhiidhkaa, waxaynu tiro kasta u qori karaa taran laba tiro ka kooban iyo hadhaa loo geeyey.

Gaar ahaan tiro kasta, waxa loo qori karaa shan lagu dhuftay tiro kale iyo hadhaa lagu daray.

Tusaale 1 :

$$135 = 27 \times 5 + 5$$

$$27 = 5 \times 5 + 2$$

$$\begin{aligned} \therefore 135 &= (5 \times 5 + 2) \times 5 + 5 \\ &= 5^2 \times 5 + 2 \times 5 + 5 \end{aligned}$$

Kolka tiro sidan oo kale loo qoro waxa la yidhaahaa waa la kala bixiyey tiradii. Haddaba, markaa la doono in tiro loo rogo sal shan, waxa loo baahan yahay in tirada la kala bixiyo oo loo qoro taran ka kooban shan iyo tiro kale iyo hadhaa.

Tusaale :

U rog $(39)_{10}$ Sal shan.

Furfurid :

$$39 = 7 \times 5 + 4$$

$$7 = 1 \times 5 + 2$$

$$\therefore 39 = (1 \times 5 + 2) \times 5 + 4$$

$$= 1 \times 5^2 + 2 \times 5 + 4$$

$$\therefore (39)_{10} = (124)_5$$

Tusaale 2 :

U rog $(123)_{10}$ Sal shan

Furfurid :

$$123 = 24 \times 5 + 3$$

$$24 = 4 \times 5 + 4$$

$$\therefore 123 = (4 \times 5 + 4) \times 5 + 3$$

$$= 4 \times 5^2 + 4 \times 5 + 3$$

$$\therefore (123)_{10} = (443)_5$$

Tusaale 3 :

U rog $(2405)_{10}$ Sal shan

$$2405 = 481 \times 5 + 0$$

$$481 = 96 \times 5 + 1$$

$$96 = 19 \times 5 + 1$$

$$19 = 3 \times 5 + 4$$

$$3 = 0 \times 5 + 3$$

$$\therefore 2405 = 3 \times 5^4 + 4 \times 5^3 + 1 \times 5^2 + 1 \times 5 + 0$$

$$\therefore (2405)_{10} = (34110)_5$$

Tusaalahani wuxu ku tusayaa kolka la doonayo tiro in sal shan loo rogo in kala bixista tirada la wadayo ilaa la gaadho tiro ka yar shan. Hadhaayada oo laysku barbar qoray marka ka ugu dambeeya lagaga bilaabo ayaa ku siinaya tirada cusub ee sal shan.

Layli :

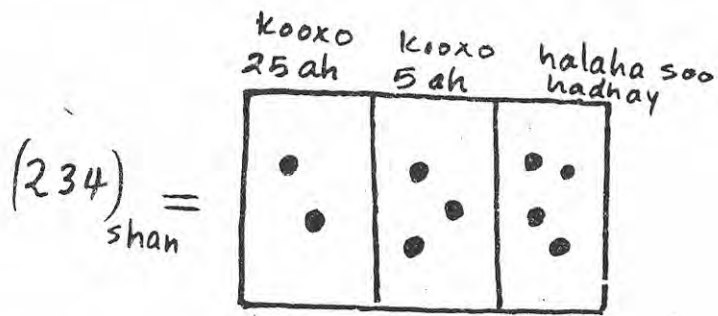
A — Tirooyinkan soo socda waa sal toban.
Waxaad u rogtaa sal shan.

- | | | | |
|---------|----------|---------|---------|
| 1) 13 | 2) 35 | 3) 382 | 4) 102 |
| 5) 335 | 6) 19 | 7) 16 | 8) 55 |
| 9) 1111 | 10) 5550 | 11) 398 | 12) 407 |
| 13) 500 | 14) 27 | 15) 42 | |

B — Tirooyinkan jaantusyo ku muuji.

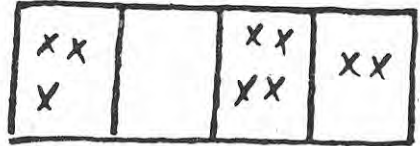
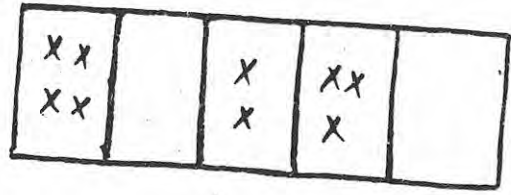
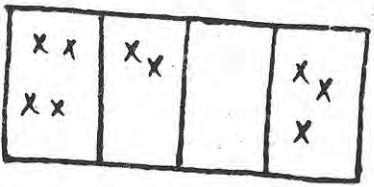
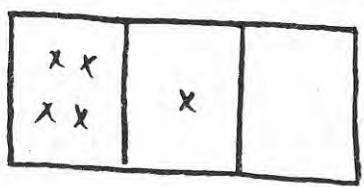
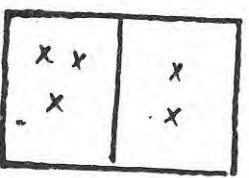
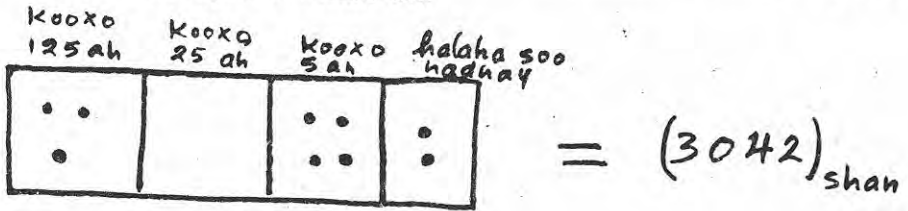
Tusaale :

$$(234)_5$$



1. $(12)_5$
2. $(20)_5$
3. $(411)_5$
4. $(3332)_5$
5. $(3)_5$
6. $(203)_5$
7. $(22424)_5$
8. $(110)_5$
9. $(3020)_5$
10. $(122)_5$

C — Jaantusyadan summadaha ku yaalla waxaad u qortaa tirooyin sal shan ah.



Tusaale :

2. Sal 2 iyo 12.

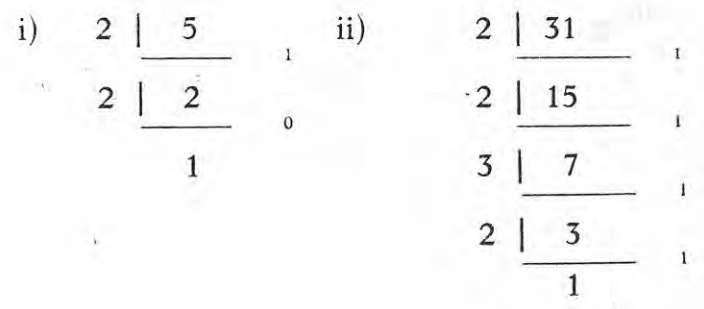
Waataynu aragnay sida loogu rogo sal shan tiro salkeedu yahay toban. Run ahaantii wax is beddelayaa ma jiraan haddii sal kale oo shan aan ahayn la qaato. Shaqada badideeda waxaynu ku muujinnay marka salku yahay shan. Kolka salku yahay laba ama toban iyo laba habkii aynu raacnay wax iska beddelayaa ma jiraan. Sidaa daraadeed waxa uun loq baahan yahay in tusaalooyin aynu u fiirsano. Sal laba ayaynu ku bilaabi doonnaa.

Tusaale :

U rog Sal laba :

- (i) $(5)_{10}$
- (ii) $(31)_{10}$

Furfuris :



Kolkaa,

$(5)_{10} = (101)_2$; $(31)_{10} = (11111)_2$

Haddii halkaynu ka qaybinaynno aynu kala bixinno tirooyinka,

$5 = 2 \times 2 + 1$
 $2 = 1 \times 2 + 0$
 $1 = 0 \times 2 + 1$

$$\begin{aligned} \therefore (5)_{10} &= (101)_2 \\ 31 &= 15 \times 2 + 1 \\ 15 &= 7 \times 2 + 1 \\ 7 &= 3 \times 2 + 1 \\ 3 &= 1 \times 2 + 1 \\ 1 &= 0 \times 2 + 1 \\ \therefore (31)_{10} &= (11111)_2 \end{aligned}$$

Ogsoonow : Haddii salku toban iyo laba yahay, tirada toban waxa u astiro ah «T», toban iyo kowna waxa astiro u ah «K».

Tusaale 2 :

U rog sal laba iyo toban $(26)_{10}$ iyo $(3454)_{10}$

Furfurid :

$$\begin{aligned} 26 &= 2 \times 12 + 2 \\ (26)_{10} &= (22)_{12} \end{aligned}$$

$$\begin{array}{r|l} 12 & 3455 \\ \hline & 287 \\ 12 & 287 \\ \hline & 23 \\ 12 & 23 \\ \hline & 1 \end{array} \quad \begin{array}{l} \\ \\ \\ \\ \\ \end{array}$$

Kolkaa $(3455)_{10} = (1KKK)_{12}$

Haddii 3455 la kala bixiyo, waxaynu heli :

$$\begin{aligned} 3455 &= 287 \times 12 + 11 \\ 287 &= 23 \times 12 + 11 \\ 23 &= 1 \times 12 + 11 \end{aligned}$$

$$3455 = \left[(1 \times 12 + 11) 12 + 11 \right] 12 + 11$$

$$= 1 \times 12^3 + 11 \times 12^2 + 11 \times 12 + 11$$

$$\therefore (3455)_{10} = (1KKK)_{12}$$

Waa taynu aragnay haddii salku yahay shan in halalka soo hadhayaa ay ka yar yihiin shan. Hadhaagu wuxuu noqonayaa 0 ilaa 4. Sidoo kale marka salku yahay laba, hadhaagu waa 0 ilaa 1. Rugta u horraysa marka midig laga soo bilaabo waa kooraad; rugta labaad waa koox laba ah, rugta saddexaad waa kooxo ah laba jibbaarka 2, rugta afraad waa kooxo saddexjibbaarka 2, iwm.

Haddaba, kolka salku yahay 12, hadhaagu wuxuu noqonayaa 0 ilaa 11. Waxa markaa suurtoowda in laba ama tiro qudh ah ay noqoto inta soo hadhaysa. Tusaalaha aynu kor ku soo aragnay waxay qudheedu kutasaysaa in hadhaagu mar kan uu yahay 11. Run ahaantii tusaalahan hadhaagu mar walba waa 11.

Tusaale kale :

$(845)_{10}$ waxaad u rogtaa sal toban iyo laba.

Furfurid :

$$\begin{aligned} 850 &= 70 \times 12 + 5 \\ 70 &= 5 \times 12 + 10 \end{aligned}$$

$$\therefore 850 = \left\{ (5 \times 12 + 10) \times 12 \right\} + 5$$

$$= 5 \times 12^2 + 10 \times 12 + 5$$

$$\therefore (845)_{10} = (5T5)_{12}$$

Layli :

A. Tirooyinkan salkoodu waa toban. U rog sal laba.

- b) 6 t) 5 j) 9 x) 11 kh) 16
- d) 31 r) 55 s) 19 sh) 39 dh) 113

B. Tirooyinkan waxaad u rogtaa sal toban iyo laba.

- (1) 17 (2) 49 (3) 84 (4) 237
 (5) 3334 (6) 1212 (7) 84976 (8) 1066
 (9) 9783 (10) 25286.

6. Sida loogu rogo sal toban tiro salkeedu yahay wax kale.

Waataynu aragnay sida tiro loogu rogo sal kale kolka salka tiradaasu yahay toban. Su'aasha hadda inoo furani waxa weeye : Sideebaa sal toban loogu soo celin karaa tiro salkeedu yahay wax kale? Jawaabta arrintaasu waa hawl yar tahay, haddii aad xusuusnaato in kooxo salka ka sameysan laysu geynayey marka tiro sal kale loo rogayo. Si ujeddadeenu u caddaato, bal aan eegno.

Tusaale :

Ka soo qaad in la rabo in $(7)_{10}$ loo rogo sal laba. Habkaynu raaci jirnay wuxuu ahaa :

$$\begin{aligned} 7 &= 3 \times 2 + 1 \\ 3 &= 1 \times 2 + 1 \\ \therefore (7)_{10} &= (111)_2 \end{aligned}$$

Haddii immika la doonayo in $(111)_2$ dib loogu ceeliyo sal toban waa inaynu dhugannaa micnaha $(111)_2$. Waxaad xusuusan kartaa in $(111)_2$ ay tahay koox afar ah, koox laba ah iyo midh soo hadhaya. Ama,

$$\begin{aligned} (111)_2 &= 1 \times 2^2 + 1 \times 2 + 1 = 4 + 2 + 1 \\ &= (7)_{10} \end{aligned}$$

Tusaale :

Sal toban maxay ku noqonaysaa $(110011)_2$?

Furfurid :

$$\begin{aligned} (110011)_2 &= 1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 1 \times 2 + 1 \\ &= 32 + 16 + 2 + 1 \\ &= (51)_{10} \end{aligned}$$

Tusaale :

Sal toban muxuu ku noqonayaa $(4332)_5$

Furfurid :

$$\begin{aligned} (4332)_5 &= 4 \times 5^3 + 3 \times 5^2 + 3 \times 5 + 2 \\ &= 500 + 75 + 15 + 2 \\ &= (592)_{10} \end{aligned}$$

Tusaale :

U rog sal toban $(7161)_{12}$

Furfurid :

$$\begin{aligned} (7161)_{12} &= 7 \times 12^3 + 1 \times 12^2 + 6 \times 12 + 1 \\ &= 12096 + 144 + 72 + 1 \\ &= (12313)_{10} \end{aligned}$$

Tusaalooyinka waxa ka muuqanaya in loo baahan yahay in tirada la kala bixiyo marka sal toban lo rogayo tiro salkeedu yahay wax kale.

Layli :

1. Sal toban u rog :

- b. $(11)_2$ t. $(1001)_2$ j. $(11111)_2$ x. $(110101)_2$
 kh) $(1011)_2$ d. $(10010011)_2$ r. $(1100)_2$
 s. $(111)_2$

2. Sal toban u rog.

- b. $(23)_5$ t. $(43)_5$ j. $(3201)_5$ x. $(44320)_5$
 kh. $(1334)_5$ d. $(1000)_5$ r. $(23401)_5$
 s. $(11101)_5$

3. Sal toban ku celi :

b. $(57)_{12}$ t. $(3K2)_{12}$

j. $(3910)_{12}$ x. $(19)_{12}$

kh. $(4039)_{12}$ d. $(2KT6)_{12}$

r. $(T3K1)_{12}$

7. Isugeyn, kala goyn iyo isku dhufasho.

Waynu naqaannaa sida laba tiro laysugu daro ama loo kala gooyo ama laysugu dhufto marka salku yahay toban. Waxaad ogsoontahay in $15+17 = 32$ oo $231-97 = 134$ oo $13 \times 6 = 78$. Isugeynta, kala goynta iyo iskudhufashadu wax inagu cusub ma aha mar haddii salku yahay toban. Haddaba maxaa isbeddelaya kolka salku uu ka duwan yahay toban. Run ahaantii wax sidaa u sii ridan oo isbeddeleyaa ma jiro; waxaase loo baahan yahay waxoogaa foajignaan ah, waayo, waxa dhici karta in kooxo salka ihi ay soo bixi karaan haddii laba tiro laysku daro ama laysku dhufto. Ujeeddadu waxay tahay : isugeynta, kala goynta iyo iskudhufashadu waa sidii hore, hase ahaatee, kolkii tiro le'ekaato ama ka weeynaato salkaba, tiradaa waxa loo celiya koox salka ah.

Intaynaan, dhex gelin masaalooyin bal aan diyaarinno tusayaasha isugeynta iyo iskudhufashada saddexda sal ee ah : 2, 5 iyo 12.

Tusayaasha isugeynta iyo iskudhufashada (Sal laba).

| | | |
|---|---|----|
| + | 0 | 1 |
| 0 | 0 | 1 |
| 1 | + | 10 |

| | | |
|---|---|---|
| X | 0 | 1 |
| 0 | 0 | 0 |
| 1 | 0 | 1 |

Tusayaasha isugeynta iyo iskudhufashada (Sal shan).

| | | | | | |
|---|---|----|----|----|----|
| + | 0 | 1 | 2 | 3 | 4 |
| 0 | 0 | 1 | 2 | 3 | 4 |
| 1 | 1 | 2 | 3 | 4 | 10 |
| 2 | 2 | 3 | 4 | 10 | 11 |
| 3 | 3 | 4 | 10 | 11 | 12 |
| 4 | 4 | 10 | 11 | 12 | 13 |

| | | | | | |
|---|---|---|----|----|----|
| x | 0 | 1 | 2 | 3 | 4 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 2 | 3 | 4 |
| 2 | 0 | 2 | 4 | 11 | 13 |
| 3 | 0 | 3 | 11 | 14 | 22 |
| 4 | 0 | 4 | 13 | 22 | 31 |

Tusaha isugeynta (Sal toban iyo laba)

| | | | | | | | | | | | | |
|---|---|----|----|----|----|----|----|----|----|----|----|----|
| + | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | T | K |
| 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | T | K |
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | T | K | 10 |
| 2 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | T | K | 10 | 11 |
| 3 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | T | K | 10 | 11 | 12 |
| 4 | 4 | 5 | 6 | 7 | 8 | 9 | T | K | 10 | 11 | 12 | 13 |
| 5 | 5 | 6 | 7 | 8 | 9 | T | K | 10 | 11 | 12 | 13 | 14 |
| 6 | 6 | 7 | 8 | 9 | T | K | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | 7 | 8 | 9 | T | K | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 8 | 8 | 9 | T | K | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 9 | 9 | T | K | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| T | T | K | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| K | K | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 1T |

Tusaha iskudhufashada (Sal toban iyo laba)

| | | | | | | | | | | | | |
|---|---|---|----|----|----|----|----|----|----|----|----|-----|
| X | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | T | K |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | T | K |
| 2 | 0 | 2 | 4 | 6 | 8 | T | 10 | 12 | 14 | 16 | 18 | IT |
| 3 | 0 | 3 | 6 | 9 | 10 | 13 | 16 | 19 | 20 | 23 | 26 | 29 |
| 4 | 0 | 4 | 8 | 10 | 14 | 18 | 20 | 24 | 28 | 30 | 34 | 38 |
| 5 | 0 | 5 | T | 13 | 18 | 21 | 26 | 2K | 34 | 39 | 42 | 47 |
| 6 | 0 | 6 | 10 | 16 | 20 | 26 | 30 | 36 | 40 | 46 | 50 | 56 |
| 7 | 0 | 7 | 12 | 19 | 24 | 2K | 36 | 41 | 48 | 53 | 5T | 65 |
| 8 | 0 | 8 | 14 | 20 | 28 | 34 | 40 | 48 | 54 | 60 | 68 | 74 |
| 9 | 0 | 9 | 16 | 23 | 30 | 39 | 46 | 53 | 60 | 69 | 76 | 83 |
| T | 0 | T | 18 | 26 | 34 | 42 | 50 | 5T | 68 | 76 | 84 | 92 |
| K | 0 | K | IT | 29 | 38 | 47 | 56 | 65 | 74 | 83 | 92 | T.I |

Tusayaashaasu waxay ku tusayaan sida laba tiro laysugu geeyo ama laysugu dhufto kolka salalku yihiin 2, 5, iyo 12. Runtii looma baahna in la qaybo tusayaasha, waxase la doonayaa inaad ogsoonaato mar alla markii tiradu ay le'ekaato ama ay ka weynaato salka in laga saaro koox salka ah.

Tusaale 1 :

Soo saar :

- b. $(11)_2 + (10)_2$ t. $(14)_5 + (34)_5$
 j. $(342)_5 + (433)_5$ x. $(97)_{12} + (35)_{12}$

Furfurid :

b. $(11)_2 + (10)_2 = (101)_2$

Hubin : $(101)_2 = 1 \times 2^2 + 0 \times 2 + 1 = (5)_{10}$

$(11)_2 = 1 \times 2 + 1 = (3)_{10}$

$(10)_2 = 1 \times 2 + 0 = (2)_{10}$

$\therefore (3+2)_{10} = (5)_{10}$

t. $(14)_5 + (34)_5 = (103)_5$

Hubin : $(103)_5 = 1 \times 5^2 + 0 \times 5 + 3 = (28)_{10}$

$(14)_5 = 1 \times 5 + 4 = (9)_{10}$

$(34)_5 = 3 \times 5 + 4 = (19)_{10}$

$\therefore (9+19)_{10} = (28)_{10}$

j. $(342)_5 + (433)_5 = (1330)_5$

Hubin : $(1330)_5 = 1 \times 5^3 + 3 \times 5^2 + 3 \times 5 = (215)_{10}$

$(342)_5 = 3 \times 5^2 + 4 \times 5 + 2 = (97)_{10}$

$(433)_5 = 4 \times 5^2 + 3 \times 5 + 3 = (118)_{10}$

$\therefore (97+118)_{10} = (215)_{10}$

x. $(97)_{12} + (35)_{12} = (110)_{12}$

Hubin : $(97)_{12} = 9 \times 12 + 7 = (115)_{10}$

$$(35)_{12} = \quad = (41)_{10}$$

$$\therefore 115 + 41 = (156)_{10}$$

$$(110)_{12} = 1 \times 12^2 + 1 \times 12 + 0 = (156)_{10}$$

Sida la isugu daro laba tiro waynu aragnay. Haddaba sidee laba tiro loo kala goyn karaa kolka Sal toban ka duwan la haysto? Waynu ogsoonnahay in kala gooyntu ay tahay is-weeydaarka isugeynta. Sidaa daraadeed wax cusubi inagu soo biiri maayaan. Habka kala goyntu wuxu ka muuqanayaa tusaalooyinkani.

Tusaale :

Raadi: b. $(43)_5 - (24)_5$ t. $(896)_{12} - (493)_{12}$
 j. $(1101)_2 - (101)_2$

Furfurid :

b. Halkan waxa la ogsoon yahay inaan 4 ka go'i karin 3. Sidaa daraadeed koox shan ah ayaa laga soo qaadayaa 4 ta kooxood, waxaana hadhaya 3 kooxood oo shan ka koobma. Kolkaa, $(43)_5 - (24)_5 = (14)_5$

Jawaabta waxa la hubin karaa haddii la ogsoonaado in :

$$(43)_5 = (23)_{10} ; (24)_5 = (14)_{10}$$

$$\therefore 23 - 14 = (9)_{10} = (14)_5$$

b. $(896)_{12} - (493)_{12} = (403)_{12}$
 t. $(1101)_2 - (101)_2 = (1000)_2$

Waataynu aragnay in isugeynta la kala hormarin karo lana hormogelin karo kolka salku uu yahay toban. Xeerarka kala hormarinta iyo hormagelintu caynkoodii ayay yihiin sal kastoo la qaato sida ka muuqata :

b. $(34)_5 + (22)_5 = (111)_5$ iyo
 $(22)_5 + (34)_5 = (111)_5$

t. $(101)_2 + (11)_2 = (1000)_2$ iyo
 $(11)_2 + (101)_2 = (1000)_2$

Kolkaa, xeerkaa kala hormarinta isugeynta waxba iska beddelimaayaan kolka salku uu ka duwan yahay toban.

$(2+4)_5 + (3)_5 = (11)_5 + (3)_5 = (14)_5$
 iyo $(2)_5 + (4+3)_5 = (2)_5 + (12)_5 = (14)_5$
 waxay ku tusayaan in isugeyntu ay hormagasho.

Iskudhufashadu iyana wax cusub ma noqonayso. Tusayaasha hore aad u aragtay ayaa hawl yaraan kuu tusaya sida laba tiro laysugu dhufto kolka salalku ay yihiin 2, 5 iyo 12.

Tusaale :

Raadi: b) $(11)_2 \times (10)_2$ t) $(234)_5 \times (332)_5$

Furfurid :

$$(11)_2 \times (10)_2 = \begin{array}{r} 11 \\ 10 \\ \hline 110 \\ 00 \\ \hline (110)_2 \end{array}$$

Xusuus: $(11)_2 = (3)_{10} ; (10)_2 = (2)_{10}$
 $\therefore (11)_2 \cdot (10)_2 = (3 \times 2)_{10} = (6)_{10}$
 $(110)_2 = 4 + 2 + 0 = (6)_{10}$

t) $(234)_5 \times (332)_5 = \begin{array}{r} 234 \\ \times 332 \\ \hline 1023 \\ 13120 \\ 131200 \\ \hline 200343 \end{array}$

$$\therefore (234)_5 \times (332)_5 = (200343)_5$$

Taana waxaynu ku hubin karaa inagoo waxaba u roгна Sal toban :

$$(234)_5 = 2 \times 5^2 + 3 \times 5 + 4 = 69$$

$$(332)_5 = 3 \times 5^2 + 3 \times 5 + 2 = 92$$

$$\therefore 69 \times 92 = 6348$$

$$\begin{aligned} (200343)_5 &= 2 \times 5^5 + 0 \times 5^4 + 0 \times 5^3 + 3 \times 5^2 + 4 \times 5 + 3 \\ &= 6250 + 75 + 20 + 3 = 6348 \end{aligned}$$

Hormagelinta iyo kala hormarinta iskudhufashada waxa laga arki karaa :

$$(3)_5 \times (4)_5 = (22)_5$$

$$(4)_5 \times (3)_5 = (22)_5$$

$$\therefore (3)_5 \times (4)_5 = (4)_5 \times (3)_5 \text{ kala hormarinta iskudhufashada.}$$

$$(\cancel{3}4)_5 \times (2)_5 = (44)_5$$

$$(3)_5 \times (\cancel{4}2)_5 = (3)_5 \times (13)_5 = (44)_5$$

$$\therefore (\cancel{3}4)_5 \times (2)_5 = (3)_5 \times (\cancel{4}2)_5 \text{ hormagelinta iskudhufashada.}$$

Layli :

A. Soo saar wadaraha :

$$1. (111)_2 + (1101)_2 \quad 2. (10)_2 + (1010)_2$$

$$3. (1111)_2 + (1001)_2 \quad 4. (432)_5 + (344)_5$$

$$5. (23)_5 + (43)_5 \quad 6. (32342)_5 + (4443)_5$$

$$7. (432+103)_5 + (104)_5 \quad 8. (96)_{12} + (75)_{12}$$

$$9. (168)_{12} + (168)_{12} + (1047)_{12}$$

$$10. (34670)_{12} + (97014)_{12}$$

B. Tiro qur ah ka dhig :

$$1. (101)_2 - (11)_2 \quad 2. (1101)_2 - (111)_2$$

$$3. (43)_5 - (34)_5 \quad 4. (342)_5 - (14)_5$$

$$5. (43420)_5 - (4341)_5 \quad 6. (2003)_5 - (1414)_5$$

$$7. (88)_{12} - (65)_{12} \quad 8. (39T0)_{12} - (407)_{12}$$

$$9. (21765)_{12} - (9430)_{12}$$

T. Waxad hubisaa in :

$$1. (43)_5 + (21)_5 = (21)_5 + (43)_5$$

$$2. (138)_{12} + (204)_{12} = (204)_{12} + (138)_{12}$$

$$3. (21+13)_5 + (40)_5 = (21)_5 + (13+40)_5$$

$$4. (83+T9)_{12} + (31)_{12} = (83)_{12} + (T9+31)_{12}$$

$$5. (13+34)_5 - (11)_5 = (13)_5 + (24-11)_5$$

$$6. (101)_2 - (10-1)_2 = (101-10)_2 + (1)_2$$

J. Isku dhufo :

$$b. (101)_2 \times (10)_2 \quad t. (43)_{12} \times (16)_{12}$$

$$j. (1213)_5 \times (210)_5 \quad x. (113)_5 \times (421)_5$$

$$kh. (15)_{12} \times (32)_{12} \quad d. (97)_{12} \times (13)_{12}$$

$$r. (T673)_{12} \times (K98)_{12} \quad s. (3333)_5 \times (42)_5$$

$$sh. (10+11)_2 \times (11)_2 \quad dh. (32)_5 \times (14+30)_5$$

$$c. (19)_{12} \times (47-39)_{12}$$

D. Buuxi meelaha bannaan :

$$1. (7 \times 2)_{12} = (\dots\dots)$$

$$2. (10 \times 11)_2 = (\dots\dots)$$

$$3. (8 \times 7)_{12} = (\dots\dots)$$

$$4. (131 \times 9)_{12} = (\dots\dots)$$

$$5. (42)_5 \times (3)_5 = (\dots\dots)$$

6. $(131)_5 \times (8)_5 = (\dots\dots\dots)$
7. $(127 \times 33)_{12} = (\dots\dots\dots)$
8. $(432)_5 \times (22)_5 = (\dots\dots\dots)$
9. $(88)_{12} \times (99)_{12} = (\dots\dots\dots)$
10. $(19 \times 3)_{10} = (\dots\dots\dots)$
11. $(19 \times 3)_{12} = (\dots\dots\dots)$
12. $(85 \times 4)_{12} = (\dots\dots\dots)$

CUTUB VII

DH E E F

Waxaan ogsoonnahay in marka lacag la amaahdo dulsaar la weyddiiyo ciddii amaahatay ha ahaato iskaashato ama qofba. Dulsaarkaa waxa laysu weyddiiyaa lacagtaa lagugu muraad qumiyey awgeed. Haddaba Dulsaarkaa la bixiyey waxa la yiraa dheef. Dheefi waa lacagta iskaashato (ama qof) ka bixiso lacag badan oo ay ku muraad qummisatay awgeed. Dheefu waxay u kala baxdaa laba jaad. Mid waxa la yiraa dheef fudud, ta kalena waxa la yiraa dheef kor.

Inta aynaan hoos u sii gelin dheefta fudud iyo dheef kor kaba waxa loo baahan yahay inaynu si wanaagsan u garanno ereyada la isticmaalo.

1. Raasamaal.

Raasamaalku waa lacagta lagu bilaabo. Lacagta lagu bilaabayaa waxa weeye ta la amaahdo ama la dhigto Baanka.

2. Dulsaarka dheefta.

Dulsaarka dheefu waa saamiga dheefta lagu weyddiiyo hal beeg ammineed (waqti) iyo raasamaalka. Halbeegga ammineed waxa loo qaataa hal sano haddii aan si kale loo xusin. Dulsaarka dheefeed waxa badanaaba loo dhigaa (tibaaxaa) boqolley ahaan.

3. Hanti.

Hantiyi waa wadarta raasamaalka iyo dheefta oo muddo go'an lagu biiriyey. Waxa kale oo aynu oran karnaa; "hantiyi waa kaydkaaga cusub marka kaydkaagii hore iyo wuxuu muddada kuu dhalay aad isku darsatid."

4. Muddo.

Waa waqtiga ama ammintaa dheefta, raasamaal lagaa siiyey laguugu daro raasamaalkaa. Si kale waxaynu u oran karnaa muddadu waa wadarta inta kalgeddis ee dheef laguugu siiyo laguuguna daraayo raasamaalka.

5. Dheef.

Dheefi waa lacagta iskaashato ka bixiso (ama qof ka bixiyo) lacag badan oo ay ku muraad qummisatay awgeed. Bada-naaba waxa dheefta lagu bixiyaa amminno (waqtiyaal) GAA-LIS isle'eg oo la xusay, sida sanadkii, sanad-barkii, ama sanad-waaxdii.

Hadda, waxaynu falanqayn doonnaa sida loo soo saaro hantida, ha ka timaaddo dheef fudud ama dheefkor ba'e. Marka ugu horreysa waxaynu eegi sida loo soo saaro hantida ka timaadda dheefta fudud. Waxaad garan kartaa in hantida ka timaadda dheefta fududi ay ku xiran tahay dheefta fudud. Kolkaas, waxa loo baahan yahay inaynu ugu horreyntii fiirinno dheefta fudud.

DHEEF FUDUD

Dheef fududi waa dheefta xisaab ahaan lagaa siiyo raasamaalkii hore muddadaa lagu adeegsanayey ama lagu muraad-saday. Ka dhig inay iskaashato dhigatay raasamaal 3000 shilin Baan bixiya sannadkiiba dulsaar ah boqolkiiba 6. Markay muddo saddex sannadood ah u taallo, sidee baynu u soo saari doonaa dheeftii raasamaalka (lacagta raasamaalku dhalay).

Marka u horraysa waxa lagu sheegay in 100 shilin oo Baanka la dhigto muddo sanad ihi ay dhalayso 6 shilin.

Kolkaa 3000 oo shilin sannadkii waxay dhalayaan :

$$\frac{6}{100} \times 3000 = 180$$

Muddo saddex sannadood ah, markaa, lacagtii waxay dhalaysaa :

$$\frac{6}{100} \times 3000 \times 3$$

$$\therefore \text{dheef fudud} = \frac{6}{100} \times 300 \times 3 = 540 \text{ shilin}$$

Haddii aynu niraahno **d.f.** ha u taagnaato dheef fudud, **R** ha u taagnaato raasamaal, **T** ha u taagnaato muddada (oo ah inta sannadood), **d** ha u taagnaato dulsaarka, markaa

masa'alada waxaad ka arkaysaa in : $d.f. = \frac{RdT}{100}$

Tusaale :

Iskaashatada Qamaddida iyo Galleyda ayaa ka amaahatay 1200 Shs. Baanka Horumarinta Soomaaliyeed si ay ugu iib-sato makiinadda cajiinka. Waxayna oggolaatay inay sannadkiiba bixiso dulsaar ah 5%. 5 sannadood dabadeed dheefta fudud ee raasamaalka laga helayaa waa imisa? Imisa ayay noqotay dheefta fududi 6 bilood dabadeed.

Furfuris :

Waxa inoo cad in 100 shilin oo la amaahday muddo sanad ah laga rabo 5 shilin oo dheef ah. Kolkaa 1200 shilin

sannadkii waxa laga doonayaa dheef ah

$$\frac{1200 \times 5}{100}$$

Haddaba, 5 sannadood dheefta raasamaalka laga helayaa waa :

$$\frac{1200 \times 5 \times 5}{100} = 300 \text{ shilin}$$

Haddii aynu adeegsan lahayn jidkaynu kor ku soo sheeg-nay, waxaynu aragnaa in :

$$d = 5\%, \quad T = 5 \text{ sannadood}, \quad R = 1200 \text{ shilin.}$$

Kolkaa,

$$d.f. = \frac{RdT}{100} = \frac{1200 \times 5 \times 5}{100} = 300 \text{ shilin.}$$

Si aynu ku helno dheefta fudud ee lixdii bilood, waxay nu ogsoonnahay in 12kii bilood 100 shilin ay dhalaan 5 shilin. Kolkaa 6 bilood dheefta 100 shilin dhasho waxay tahay :

$$\frac{5 \times 6}{12} \text{ shilin}$$

Sidaa awgeed, 1200 shilin dheeftoodu waa :

$$\frac{1200 \times 5}{100} \times \frac{6}{12} = 30/=$$

Jidkeennii oo ay $R = 1200/=$, $d = 5\%$, $T = 6/12$ sannadood wuxuu ina siinayaa :

$$d.f. = \frac{RdT}{100} = \frac{1200 \times 5 \times 6}{100 \times 12} = 30/=$$

Haddii aynu soo gabagabayno waxaynu ka hadlayney wa-xay isugu soo ururaysaa :

$$\text{dheef fudud} = \frac{\text{Raasamaal} \times \text{Dulsaar} \times \text{Muddo}}{100}$$

$$\text{ama d.f.} = \frac{RdT}{100}$$

Ilaa iyo hadda, waxaynu isku dayeynay inaynu raadinno dheefta fudud, waxaynu helnay jid inoo fududaynaya haw-shaa. Haddii iminka aynu arrintaa si kale u eegno oo aynu raadinno hantida, waxaynu ogsoonnahay in hantidu ay tahay raasamaalka iyo dheeftoo laysku daray.

$$\text{Kolkaa, Hanti} = \text{Raasamaal} + \text{Dheef}$$

$$\text{Ama H} = R + \frac{RdT}{100}$$

$$\text{dabadeedna H} = R \left[1 + \frac{dT}{100} \right] \text{ iyadoo R isir ahaan'loo saaray}$$

Tusaale :

Waa intee hantida iskaashato u taalla 5 sannadood dabadeed Baanka Kaydka iyo Amaahda oo sannadkiiba bixiya dulsaar ah 6%. Iskaashatadu waxay Baanka dhigatay 3000/=.

Furfuris :

Jidka Hantidu waxa weeye :

$$\begin{aligned} H &= R \left[1 + \frac{dT}{100} \right] \\ &= 3,000 \left[1 + \frac{6 \times 5}{100} \right] = 3,900/= \end{aligned}$$

Haddii aynu rabno waxaynu marka hore soo saari doonaa dheefta, kolkaasaynu ku dari doonaa raasamaalka :

$$\text{d.f.} = \frac{RdT}{100} = \frac{3000 \times 6 \times 5}{100} = 900/=$$

$$\therefore \text{Hanti} = 3000 + 900 = 3900/=$$

Laylisiyo :

1. 500 oo shilin ayaa la dhigtay Baanka. Haddii uu **baanku** bixiyo sannadkiiba dulsaar ah $4\frac{1}{2}\%$, lacagtuna ay muddo 3 sannadood ah baanka taallay; soo saar dheefta fudud ?
2. Lacag ayaa la dhigtay baanka. Sannadkiiba waxa uu bixiyaa dulsaar $4\frac{1}{2}\%$ ah. Haddii lacagtu ay tiillay saddex sannadood, dheefta laga helay ay ahayd 60.75 shilin, intee baa la dhigtay baanka?
3. Iskaashatada Udugga ayaa dhigatay 6000 Sh. baan-bixiya dulsaar ah 5% sannadkii. Soo saar hantideeda lix sannadood dabadeed ?
3. Iskaashatada Udugga ayaa dhigatay 6000 Sh. Baanku wuxuu bixiyaa dulsaar ah 5% sannadkii. Soo saar hantideeda lix sannadood dabadeed ?
4. Haddii baanku bixiyo dulsaar $5\frac{1}{2}\%$ sannad barkiiba (lixdii biloodba). Dheefta fudud ee laga helayaa 650 shilin oo $2\frac{1}{2}\%$ sannadood taallay baanka waa intee? $2\frac{1}{2}\%$ sannadood dabadeed hantidu intay noqonaysaa ?
5. 2500 shilin oo la amaahiyey Iskaashatada Kabaha afar sannadood ayaa keentay hanti ah 3000 shilin. Boqolkiiba dulsaarku waa intee ?
6. Iskaashatada Beeyada ee degmada Qandala ayaa lacag dhigatay baanka kaydka iyo Amaahda ee Laanta Boosaaso oo sannadkiiba bixiya dulsaar 5% ah. Markay 4 sannadood lacagtu baanka taallay, hantidu waxay noqotay 6,000 Sh. Soo saar intay dhigatay ?
7. Baan ayaa saddexdii biloodba dheef fudud oo ah $2\frac{1}{2}\%$ bixiya. Sannad dabadeed dheefta laga helayo 400 shilin waa intee ?

8. 1350 shilin ayaa 4 sannadood baanka taallay. Hantidii waxay noqotay 1530 shilin. Boqolkiiba dulsaar intee ah ayuu bixiyay baanku?
9. 500 shilin ayay Iskaashato ka amaahatay Baanka Horumarinta si ay ugu ballaarisoo hawlaheeda. Haddii sannadkiiba ay bixiso dulsaar ah 4% oo isla markaana ay bixiso 1200 shilin sannadka dhammaadkiisa, laba sannadood dabadeed intee lacag lagu leeyahay?
10. Kee baa dheef badan 200 shilin oo saddex sannadood taallay Baan bixiya dheef fudud oo 4% ah iyo 120 shilin oo la dhigtay muddo 5 sannadood ah Baan bixiya dheef fudud oo ah $4\frac{1}{2}\%$?
11. Soo saar hantida ay isdheer yihiin 1500 shilin oo la dhigtay saddex sannadood Baan bixiya $2\frac{1}{2}\%$ iyo 1200 oo la dhigtay 5 sannadood Baan bixiya 5%.
12. 1200 shilin ayaa la dhigtay baan bixiya sannadkii dulsaar 3% ah. Laba sannadood dabadeed ayaa laga qaatay 400 shilin, 5 sannadood dabadeed dheefta laga helayaa waa imisa?
13. Hanti 540 shilin ah ayaa laga helay raasamaal laba sannadood yaallay baan bixiya dheef fudud oo dulsaarkeedu yahay 4%. Waxa iyana Hanti 517.50 shilin laga helay raasamaal saddex sannadood yaallay baan bixiya sannadkiiba dulsaar ah 5%. Labada raasamaal intee is dheer yihiin?

DHEEF KOR

Waxaynu hore u soo aragnay in laga helo ama laga qaato dheef lacag lagu muraadsaday muddo go'an. Dheeftaana waxaynu hore ugu bixinay dheef fudud. Hadda, haddii raasamaal, dheef lagaa siiyo dhawr goor muddaday kuu taalay dhexdeeda, oo markastana dheefta lagu xisaabiyey lagu daro asamaalkii hore ee ay ka dhalatay; oo haddana raasamaalka cusub dheef lagu qaato, sidaas oo miiran intay muddadu ka

dhammaanayso. Waxaynu oran karnaa raasamaalkuun ma'ahée dheef baa dheef lagu helaa. Habka caynkaas ah waxa loo yaqaan DHEEF KOR. Gaalisyada u dhexeeya amminaha (waqtiyada) dheefta lagu bixiyo waxa la yiraa Kalgaddis (ama al). Kalgaddisyadu waxay noqdaan sannad, sannad-bar, sannad-waax ama bilo. Kalgaddisyadu markay noqdaan in aan sannad ahayn (sannad ka yar) way ka sarreysaa heerkeennan waxbarashada ee hadda. Hantida ka dhalata raasamaal iyo dheefkor waxa la yiraa **Hantikor**. Haddaba dheefkorka la xasladay waa faraqa u dhexeeya Hantikor iyo raasamaalkii hore.

Haddii aynu soo gabagabeyno, waxyaalaha uu dheefkor ku kaga geddisan yahay dheefta fudud, waxaynu oran karnaa:

- (1) Muddada dhexdeeda raasamaalka laftiisa ayaa si tartiib ah u kora kalba kalkuu ka dambeeyo;
- (2) Dheeftu way badataa kalba kalkuu ka dambeeyo.

1. Soo saarista dheef-korka.

Hadda waxaynu doonaynaa inaynu ogaanno sida loo soo saaro dheefkorka. Waxa inoo suurowda inaynu laba jid hadba kaynu doonno raacno. Jidka hore waxa la yiraa: Marinka Dheer. Wuxuuna hawl yar yahay markay muddo gaaban tahay. Jidka labaad oo la yiraa: Jidka dheefkorka waxa la raacaa markay muddadu dheer tahay.

2. Marinka Dheer.

Hore, waa taynu u niri dheef korka waxa loo soo saaraa kal-kal, iyadoo dheefta iyo raasamaalka kal walba laysku daraayo, noqonaayana raasamaalka kalka ka dambeeya. Haddaba, marinka dheeri wax kale ma'ahée waa dheeftoo kalgaddis walba goonidiisa loo soo saaro.

Tusaale 1:

Raadi dheef korka laga helayo 6193 shilin muddo 3 sannadood ah haddii dulsaarku uu yahay 4%.

Furfurid :

| | | | |
|---------------|-----------|-------------|--------|
| Sannadka 1aad | Raasamaal | 6193 | Shilin |
| | Dheef 4% | 247.72 | » |
| Sannadka 2aad | Raasamaal | 6440.72 | » |
| | Dheef 4% | 257.6288 | » |
| Sannadka 3aad | Raasamaal | 6698.3488 | » |
| | Dheef 4% | 267.933952 | » |
| | Hanti | 6966.282752 | » |

Dheefkorkii 30 3 god oo jajab tobanle laysugu soo celiyay waa :

$$247.720 + 257.629 + 267.934 = 773.283 \text{ shilin.}$$

Jawaabta waxa kaloo aynu ka heli karnaa hantida iyo raasamaalka oo aynu kala goyno.

$$\begin{aligned} \text{Dheef} &= \text{Hanti} - \text{Raasamaal} \\ &= 6966.283 - 6193.000 = 773.283 \text{ shilin.} \end{aligned}$$

Tusaale 2 :

Soo saar hantida iyo dheef korka laga helay 1817.8 shilin oo la dhigay muddo 4 sannadood ah baan bixiya dul-saar ah 5%.

Furfurid :

| | | | |
|---------------|-----------|----------------|-----|
| Sannadka hore | Raasamaal | 1817.8 | Sh. |
| | Dheef 5% | 90.890 | » |
| Sannadka 2aad | Raasamaal | 1908.690 | » |
| | Dheef 5% | 95.43450 | » |
| Sannadka 3aad | Raasamaal | 2004.12450 | » |
| | Dheef 5% | 100.2061250 | » |
| Sannadka 4aad | Raasamaal | 2104.5306250 | » |
| | Dheef 5% | 105.216531250 | » |
| | | 2209.547156250 | » |
| | Hanti | = 2209.547 | Sh. |

$$\begin{aligned} \text{Dheef kor} &= \text{Hanti kor} - \text{Raasamaal} \\ &= 2209.547 - 1817.8 \text{ Sh.} \\ &= 391.747 \text{ Sh.} \end{aligned}$$

Xusuusnow in dheef korku uu yahay dheefahoo laysu geeyay.

$$90.890 + 95.435 + 100.206 + 105.217 = 391.748. \text{ Sh.}$$

Tusaale 3 :

Raadi hantida iyo dheef korka ay keentay 750 shilin oo

$$3 \text{ sannadood lagu kaydiyey baan bixiya dulsaar ah } 3\frac{1}{2}\%.$$

Furfurid :

| | | | |
|---------------|---|--------------|-----|
| Sannadka hore | Raasamaal | 750.00 | Sh. |
| | Dheef $\left\{ \begin{array}{l} 3\% \\ 1 \\ -\% \\ 2 \end{array} \right.$ | 22.50 | » |
| | | 3.750 | » |
| Sannadka 2aad | Raasamaal | 776.25 | » |
| | Dheef $\left\{ \begin{array}{l} 3\% \\ 1 \\ -\% \\ 2 \end{array} \right.$ | 23.2875 | » |
| | | 3.88125 | » |
| Sannadka 3aad | Raasamaal | 803.41875 | » |
| | Dheef $\left\{ \begin{array}{l} 3\% \\ 1 \\ -\% \\ 2 \end{array} \right.$ | 24.1025625 | » |
| | | 4.01709375 | » |
| | | 831.53840625 | Sh. |

= 831.5384 iyadoo 4 god oo jajab tobanle loo soo celiyay.

∴ Dheefkor = Hantikor — Raasamaal
= 831.5384 — 750.000
= 81.5384 Shilin.

Laylisyo :

Laylisyadan jawaabahoo dhan waa in loo soo celiyaa laba god oo jajab tobanle.

Waxaad soo saarta dheef korka laga helay :

1. 250 Shilin muddo 2 sannadood ah haddii dulsaarku yahay 5%.
2. 3450 Shilin muddo 3 sannadood ah haddii dulsaarku yahay 4%.
3. 1238.75 Shilin muddo 3 sannadood ah haddii dulsaarku yahay 3%.
4. 627.38 Shilin muddo 4 sannadood ah haddii dulsaarku yahay 5%.
5. 1200 Shilin muddo 4 sannadood ah haddii dulsaarku yahay 6%.
6. 3528.6 Shilin muddo 3 sannadood ah haddii dulsaarku yahay 5%.
7. 476.85 Shilin muddo 4 sannadood ah haddii dulsaarku yahay 3%.
8. 1500.55 Shilin muddo 4 sannadood ah haddii dulsaarku yahay 7%.
9. 7736.00 Shilin muddo 2 sannadood ah haddii dulsaarku yahay $1\frac{1}{2}$ %.
10. 6246.1 Shilin muddo 5 sannadood ah haddii dulsaarku yahay 5%.

Raadi hantida iyo dheef korka laga helay :

11. 600 Shilin muddo 3 sannadood ah haddii dulsaarku yahay 4%.
12. 755.5 Shilin muddo 4 sannadood ah haddii dulsaarku yahay 5%.
13. 3636.75 Shilin muddo 2 sannadood ah haddii dulsaarku yahay 7%.
14. 7258 Shilin muddo 3 sannadood ah haddii dulsaarku yahay 6%.
15. 1679.85 Shilin muddo 4 sannadood ah haddii dulsaarku yahay 3%.
16. 3200 Shilin muddo 2 sannadood ah haddii dulsaarku yahay $2\frac{1}{2}$ %.
17. 18500 Shilin muddo 3 sannadood ah haddii dulsaarku yahay $3\frac{3}{4}$ %.
18. 600 Shilin muddo 3 sannadood ah haddii dulsaarku yahay $2\frac{1}{4}$ %.
19. 1105.70 Shilin muddo 2 sannadood ah haddii dulsaarku yahay $3\frac{1}{4}$ %.
20. 960.65 Shilin muddo 3 sannadood ah haddii dulsaarku yahay $4\frac{1}{4}$ %.

Intey is dheeryihiin dheefta fudud iyo dheef korka laga helay :

21. 385 Shilin muddo 3 sannadood ah haddii dulsaarku yahay 3%.
22. 853 Shilin muddo 4 sannadood ah haddii dulsaarku yahay 4%.
23. 1267.35 Shilin muddo 5 sannadood ah haddii dulsaarku yahay 2%.
24. 9783.45 Shilin muddo 3 sannadood ah haddii dulsaarku yahay 3%.
25. 246 Shilin muddo 3 sannadood ah haddii dulsaarku yahay 6%.

3. Jidke dheefkorka.

Kolkaad fiirisid casharkii kan ka horreeyey, waxaad ari keysaa inaynu hellay waddo loo raaco soo saarista dheefkorka. Dariiqada aynu raacaynay waxa lagu isticmaali karaa dheefkorka markastaba. Hase yeeshee, kolkay muddu badan tahay dhibaato weyn ayay dariiqadaasi keenaysaa. Sidaa daraadeed, waxa lagama maarmaan ah inaynu raadinno si ka hawl yar sidii hore. Waxaynu hadda baran doonnaa jid inoo fududeeya hawshaa. Jidkaasi wuxuu ka imanayaa waddadii hore ee aynu raacnay.

Hadda, waxba isku hawli mayno inaynu soo saarno jidkaa, waayo way ka sarreeysaa heerkeenna waxbarashada ee hadda. Hase yeeshee, sideeda ayaynu u qaadan doonaa oo qalab ahaan baynu u adeegsan

Haddii hantidu tahay H, raasamaalkuna yahay R, dulsaar d yahay, muddaduna n tahay, oo kalgeddiskuna yahay sannad (dheeftu waxay kortaa sannadkiiba mar), haddaba Hantikorka muddadaa waxa lagu helaa jidkan:

$$H = R \left[1 + \frac{d}{100} \right]^n$$

Sidaynu horeba dheefta fudud uga aragnay, waxaynu halkanna ka gaari karnaa in :

$$\text{dheefkor} = \text{hantikork} - \text{raasamaal}$$

$$\begin{aligned} \text{d.k.} &= R \left[1 + \frac{d}{100} \right]^n - R \\ &= R \left\{ \left[1 + \frac{d}{100} \right]^n - 1 \right\} \text{kolka R Isir ahaan} \\ &\quad \text{loo saaro.} \end{aligned}$$

Tusaale 1 :

Waa imisa hantidu, haddii 250 shilin muddo laba sannadood ah lagu kaydsaday baan bixiya dulsaar 3% ah oo sannadkii la koriyo (sannadkii mar la bixiyo).

Furfuris :

Jidka dheefkorku waxa weeye :

$$H = R \left[1 + \frac{d}{100} \right]^n$$

Hadda, R = 250/=, d = 3%, n = 2 sannadood

$$\begin{aligned} \text{Haddaba : } H &= 250 \left[1 + \frac{3}{100} \right]^2 \\ &= 250 (1 + 0.03)^2 \\ &= 250 (1.03)^2 = 250 \times 1.0609 \\ &= 265.225 \text{ shilin.} \end{aligned}$$

Tusaale 2 :

Iskaashatada Qamaddida ayaa dhigatay 3200/= Baan bixiya dulsaar 5% ah oo sannad koriya. Waa imisa hantideedu saddex sannadood dabadeed ?

Furfuris :

Hadda $R = 3200/=$, $d = 5\%$, $n = 3$ sannadood

$$\begin{aligned} \text{Markaa : } H &= 3200 \left[1 + \frac{3}{100} \right]^3 \\ &= 3200 (1.05)^3 \\ &= 3200 \times 1.157625 = 3705.600 \text{ shilin} \end{aligned}$$

Tusaale 3 :

Iskaashatada **Farshaxannada** Soomaaliyeed ayaa dhigatay 4,000 shilin Baanka Kaydka iyo Amaahda ee Soomaaliyeed oo bixiya dulsaar 4% ah oo sannadkii koriya. Dheefkorkeedu waa intee afar sannadood ka dib?

Furfuris :

Jidka dheefkorku wuxuu ahaa :

$$H = R \left[1 + \frac{d}{100} \right]^n$$

Hadda $R = 4,000$ shilin, $d = 4\%$, $n = 4$ sannadood

$$\begin{aligned} \text{Markaa : } H &= 4000 \left[1 + \frac{4}{100} \right]^4 \\ &= 4000 (1 + 0.04)^4 \\ &= 4000 (1.04)^4 \end{aligned}$$

Kolka ugu horreysa waa inaynu soo saarnaa $(1.04)^4$.

$$\text{Waxaad ogtahay inay } (1.04)^4 = (1.04)^2 \times (1.04)^2$$

$$\text{Ha yeeshee. } (1.04)^2 = (1.04) \times (1.04) = 1.0816$$

$$\begin{aligned} \text{Kolkaana } (1.04)^4 &= (1.04)^2 \times (1.04)^2 \\ &= 1.0816 \times 1.0816 \end{aligned}$$

$$= 1.1699$$

Marka loo soo celiyo 4 god oo jabjab tobanle.

$$\begin{aligned} \text{Sidaa awgeed, } H &= 4000 (1.04)^4 = 4000 \times 1.1699 \\ &= 4679.6 \text{ shilin} \end{aligned}$$

$$\begin{aligned} \text{Haddaba : } \text{dheefkorku} &= \text{Hanti} - \text{Raasamaal} \\ &= 4679.6 - 4000 \\ &= 679.6 \text{ shilin} \end{aligned}$$

Haddii aynu adeegsanno jidkii laga soo dheegay jidka dheefkorka ee ina siiya dheefkorka iyadoon hantida loo sii marin. Kaasi wuxuu ahaa :

$$\text{Dheefkor} = R \left\{ \left[1 + \frac{d}{100} \right]^n - 1 \right\}$$

$$\text{Haddaba D.K.} = 4000 \left\{ \left[1 + \frac{4}{100} \right]^4 - 1 \right\}$$

$$= 4000 \left\{ (1 + 0.04)^4 - 1 \right\}$$

$$= 4000 \left\{ (1.04)^4 - 1 \right\}$$

$$= 4000 (1.1699 - 1)$$

$$= 4000 \times 0.1699$$

$$= 679.6 \text{ shilin.}$$

Hadda waxaad aragtaa in dheefkorku isku mid yahay la-daba marin kaynu doonno aynu raacnee.

OGOW:

1. Marka hantida la doonaayo ugu horrayntii waxa la soo saaraa $\left[1 + \frac{d}{100}\right]^n$. Kolkaa dabadeed ayaa lagu dhuf-taa raasamaalka (R). Waxa iyana door roon in dulsarka (d) loo rogo jajab tobanle.

2. Ma habboona in jidkan

$$d.k. = R \left\{ \left[1 + \frac{d}{100}\right]^n - 1 \right\}$$

la qaybo, ee waxaa hawl yar in hantida la raadiyo dabadeedna raasamaalka laga gooyo.

Loo o:

b. Masa'alooyinka 1 – 10, waxaad soo saarta hantida, haddii:

1. 300 shilin uu dulsaarkeedu yahay 5% sanadkii muddo 2 sannadood ah.
2. 4500 shilin uu dulsaarkeedu yahay 3% sanadkii muddo 3 sannadood ah.
3. 185 shilin uu dulsaarkeedu yahay 4% sanadkii muddo 3 sannadood ah.
4. 200 shilin uu dulsaarkeedu yahay 3% sanadkii muddo 4 sannadood ah.
5. 875 shilin uu dulsaarkeedu yahay 6% sanadkii muddo 2 sannadood ah.
6. 240 shilin uu dulsaarkeedu yahay 5% sanadkii muddo 3 sannadood ah.
7. 100 shilin uu dulsaarkeedu yahay 1% sanadkii muddo 5 sannadood ah.

8. 160 shilin uu dulsaarkeedu yahay 4% sanadkii muddo 3 sannadood ah.
9. 350.8 shilin uu dulsaarkeedu yahay 5% sanadkii muddo 2 sannadood ah.
10. 580 shilin uu dulsaarkeedu yahay 3% sanadkii muddo 3 sannadood ah.
- t. Masa'alooyinka 11 – 20, waxaad raadisaa dheef koo haddii:
 11. 960 shilin uu dulsaarkeedu yahay 4% sanadkii muddo ah 3 sannadood.
 12. 1253 shilin uu dulsaarkeedu yahay 2% sanadkii muddo ah 3 sannadood.
 13. 1500 shilin uu dulsaarkeedu yahay $1\frac{1}{2}$ % sanadkii muddo ah 2 sannadood.
 14. 250.5 shilin uu dulsaarkeedu yahay 5% sanadkii muddo ah 2 sannadood.
 15. 19000 shilin uu dulsaarkeedu yahay 3% sanadkii muddo ah 3 sannadood.
 16. 6320 shilin uu dulsaarkeedu yahay 4% sanadkii muddo ah 3 sannadood.
 17. 1200 shilin uu dulsaarkeedu yahay 1% sanadkii muddo ah 4 sannadood.
 18. 700 shilin uu dulsaarkeedu yahay $\frac{1}{2}$ % sanadkii muddo ah 2 sannadood.
 19. 500 shilin uu dulsaarkeedu yahay 3% sanadkii muddo ah 2 sannadood.
 20. 1600 shilin uu dulsaarkeedu yahay $2\frac{1}{2}$ % sanadkii muddo ah 2 sannadood.
- j. Masa'alooyinka 21 – 30, waxaad raadisaa intay is dheeryihiin dheefta fudud iyo dheef korka laga helayo:

| | | | |
|-----|---|--------|----------|
| 21. | 200 shilin dulsaarkoodu yahay muddo 3 sannadood ah. | 4% | sanadkii |
| 22. | 1300 shilin dulsaarkoodu yahay muddo 4 sannadood ah. | 3% | sanadkii |
| 23. | 2525 shilin dulsaarkoodu yahay muddo 2 sannadood ah. | 2% | sanadkii |
| 24. | 16200 shilin dulsaarkoodu yahay muddo 3 sannadood ah. | 1% | sanadkii |
| 25. | 1500 shilin dulsaarkoodu yahay muddo 2 sannadood ah. | 2 1/2% | sanadkii |
| 26. | 350 shilin dulsaarkoodu yahay muddo 2 sannadood ah. | 5% | sanadkii |
| 27. | 1486 shilin dulsaarkoodu yahay muddo 2 sannadood ah. | 4% | sanadkii |
| 28. | 3000 shilin dulsaarkoodu yahay muddo 3 sannadood ah. | 2% | sanadkii |
| 29. | 225 shilin dulsaarkoodu yahay muddo 2 sannadood ah. | 1 1/2% | sanadkii |
| 30. | 600 shilin dulsaarkoodu yahay muddo 3 sannadood ah. | 3% | sanadkii |

CUTUB VIII

FOGAAN, XAWAARE IYO WAQTI

Socdaal marka la galo badanaa waxa maskaxdeenna ku soo dhaca waxyaabo gaar ah. Waxa kolkiiba innagu soo dhacaya waxa ka mid ah: intay jirtaa meesha la doonayo in la gaaro, waqtiga lagu gaarayaa waa intee iyo saacaddiiba inta la socon karayo. Socdaalka laga hadlayaa ma aha ka dadka oo qudh ah, waxa loo jeedaa wax kastoo socda sida dadka, xoolaha, gawaarida iyo wixii la mid ah.

Sidaynu hore u soo sheegnay, marka socod yimaaddo waxa loo baahan yahay in la ogaado meesha la doonayo in la gaadhaa intay ka durugsan tahay halka la joogo. Laba meelood intay kala durugsan yihiin ama isu jiraan waxa badanaa lagu qiyaasaa intay fogaantoodu tahay. Sida badan waxa la yi-dhaahaa meel hebilaayo iyo meel hebilaayo fogaantoodu waa intaa. Markii wax la qiyaasayo waxa lagama maarmaan ah in lagu heshiiyo sida wax loo qiyaasayo. Qiyaasaha fogaanta waxa u sal ah **maylka** ama **kiiloomitirka**. Maylka waxa leh Ingriiska. Kiiloomitirkase waxa lahaa Faransiiska, waxase qaatay adduunyada badideeda. Haddaba marka la rabo in la ogaado laba meelood intay isujiraan, badanaa waxa la yiraa-haa intasoo mayl ama kiiloomitir ayey isu jiraan. Masalan, waxaynu odhanaynaa Burco iyo Hargeysa waxay isu jiraan 130 mayl ama 208 kiiloomitir. Afgooye iyo Xamar waxay isu jiraan 30 kiiloomitir ama 18.75 mayl. Waxa kaloo la oran karaa fogaanta Xamar iyo Afgooye waa 50 kiiloomitir.

Haddii qiyaasta gaar u noqotay ay tahay kiiloomitirka ama maylka, waqtigana waxa lagu qiyaasaa saacad. Waxaad xusuusan kartaa in hal saac ay la mid tahay 60 miridh, miridh-kiina uu yahay 60 seken. Ujeeddadeenna u weyni waxa weeye inaynu ogaanno waxa ka dhexeeya fogaanta iyo waqtiga. Si aynu ku aragno waxa ka dhexeeya labada wax, xusuusnow meel waqtiga lagu gaarayaa inay ku xiran tahay fogaanta ay meeshu jirto iyo hadba sidii loo socdo. Degdeg haddii loo socdo waqtigii waa yaraanayaa; haddii qunyar loo socdana wuu badanayaa. Sida loo socdo, degdeg ama qunyar ha ahaatee, waxaynu odhan doonnaa **xawaare**. Mar haddii waqtiga meel lagu

qaadhayaa uu ku xidhan yahay sida loo xawaareeyo iyo fogaanta la soconayo, waxa la ogaaday in xawaaruhu uu yahay fogaanta oo loo qaybiyey waqtiga.

Haddii aynu nidhaahno astada fogaantu ha noqoto s , ta waqtiguna ha noqoto t , xawaaruhuna ha ahaado, v , kolkaa :

$$\text{Xawaare} = \frac{\text{Fogaan}}{\text{Waqti}} \quad \text{Waxay tahay}$$

$$v = \frac{s}{t}$$

Kolkaana fogaantu waxay tahay taranta xawaaraha iyo waqtiga. $s = vt$.

Tusaale 1 :

Baabuur ayaa magaalo jirta 240 kiiloomitir ku gaadhay 4 saacadood. Xawaaraha Baabuurku waa intee?

Furfurid :

Waxaynu haysanna $s = 240 \text{ km.}$, $t = 4 \text{ saacadood}$, iyo $s = vt$

$$\therefore v = \frac{s}{t} = \frac{240 \text{ km}}{4 \text{ saacadood}} = 60 \text{ km/saacaddii.}$$

Tusaale 2 :

Laba nin baa mar ka soo wada bilaabay socod laba magaalo oo isu jira 30 mayl. Nin wuxuu saacaddii socday 5 mayl, midna 4 mayl. Laba saacadood dabadeed intay isu jiraan labadii nin?

Furfurid :

Haddii aynu raacno $s = vt$

Ninka 5 mayl saacadii socda, laba saacadood wuxuu socday 5 x 2 = 10 mayl.

Ninka 4 mayl saacaddii socda, laba saacadood wuxu soconayaa $4 \times 2 = 8$ mayl.

Fogaanta ay labada nin socdeen waa :

$$10 \text{ mayl} + 8 \text{ mayl} = 18 \text{ mayl.}$$

Kolkaa waxay isu jiraan $30 - 18 = 12$ mayl.

Layli :

1. Nin baa saacaddii socda 5 mayl, Imisa saacadood dabadeed ayuu gaadhayaa meel jirta 30 mayl?
2. Baabuur ayay ku qaadatay 3 saacadood inuu ku gaadho magaalo jirta 240 km. Xawaaraha baabuurku waa intee saacaddii?
3. Xawaare ah :
 - (a) 80 km. saacaddii waa intee mitir miridhkii?
 - (b) 80 mayl saacaddii waa intee fuudh sekenkii?
4. Faras baa magaalo jirta 50 km. ku gaadhay 2 saacadood.

Faras kalana magaaladii ayuu ku gaadhay $2 \frac{1}{2}$ saaca-

dood. Labada faras xawaarohoodu intuu is dheer yahay?

5. Baabuur ayaa xawaarihiisu yahay 64 km. saacaddii. 3 saacadood fogaantuu soconayaa waa imisa?
6. Keebaa la hor gaarayaa meel jirta 60 km., haddii xawaaruhu yahay 25 km., saacaddii iyo meel jirta 80 km., haddii xawaaruhu yahay 35 km., saacaddii?
7. Nin soconaya 3 mayl saacaddii ayaa magaalo ka baxay.

Saacad dabadeed ayuu nin soconaya $3 \frac{1}{2}$ mayl saacadii

ka dabategey ninkii hore. Laba saacadood marka laga joogo goortuu ninka dambe socodka bilaabay, intee bay isu jiraan labada nin?

3. Saddex magaalo A, B iyo T ayaa waxay sameeyaan saddexagal. A iyo B waxay isu jiraan 200 km. B iyo T waxay kala durugsan yihiin 150 km. T iyo A waxa u dhexeeya 300 km. Baabuur ayaa xawaarihiisu yahay A ilaa B 100 km. saacadii, B ilaa T 60 km. saacadii T ilaa A 80 km. saacadii. Imisa saacadood dabadeed ayuu baabuurkii ku soo noqonayaa A, haddii uu soo maray B iyo T? Haddii xawaaraha baabuurku aanu iska beddelin 80 km. saacadii, goorma ayuu ku soo noqon lahaa A?

CUTUB IX

G A R A A F

Badanaa, waxa ina soo mara xidhiidh ka dhexeeya la. vax. Haddaad weligaa soo martay dugsi la seexo, waad ogtahay in cuntada maalintii la bixiyaa ay ku xidhan tahay inta arday ee joogta dugsi subaxdii. Haddii ardaydu yaraato, cuntaduna way yaraanaysaa. Waxa badanaa dhacda in loo baahdo mararka qaarkood in la arko sida cuntadu guud ahaan in baxdo. Tusaale kale haddaad eegtid, waxaad ogsoon tahay in inta baabuur ee isduqaysa bishii magaalada Xamar la ogsoon yahay. Sidaa daraadeed, sanadkii inta isduqaysa waa la ogsoon yahay oo weliba waxa la heli karaa sanadobadan inta isduqaysay. Taasu waxay dhalisaa in badanaa sawir lagu muujiyo baabuurta is-jiidhay. Sawirkana waxa la yidhaahdaa «Garaaf». Garaafku waxa weeye sawir ku tusaya xidhiidhka ka dhexeeya laba wax, ujeeddaduna waxa weeye in sawir hawl yaraan ay uga muuqato waxa ka dhexeeya labada wax. Garaafyadu waa jaadad dhawr ah. Hase yeeshee, kulligood waxay ka siman yihiin inay muujiyaan laba wax - xidhiidhka ka dhexeeya. Sidaa daraadeed waxa lagama maarmaan ah in labada wax ay ka muuqdaan «garaafka». Badanaa qiyaas gaar ah ayaa loo qaataa mid walba. Looma baahna in labada qiyaasood isle'ekaadaan.

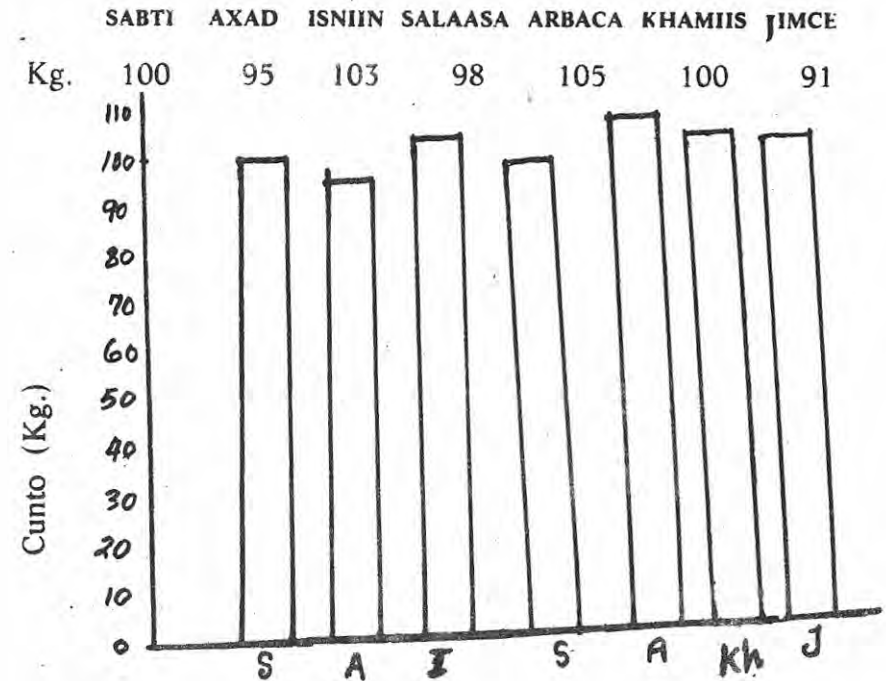
Hore, waxaynu u niri «garaafyadu» waa dhawr jaad. Baabuur eegno qaar «garaafyadaa» ka mid ah.

1. Garaaf Jiitimeed.

Garaafka caynkan ihi wuxuu isticmaalaa jiitin. Jiitinta dhererkeedu wuxuu u taagan yahay laba wax oo la doonayo in jaantus lagu muujiyo midkood, balladhka jiitintuna wuxuu u taagan yahay ka kale.

Tusaale 1 :

Shaxanka hoos ku yaallaa waxa weeye cuntada dugsi la seexdaa siiyey ardayda dugsi muddo toddoba casho ah. Garaaf jiitimeed ku muuji cuntada :



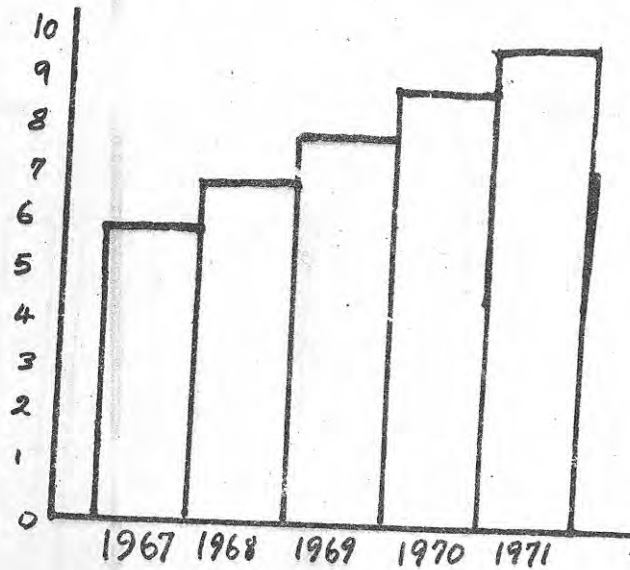
Waxa jaantuska kaaga muuqanaya in xarriiqda taagan tusayso inta maalintii cunto la bixiyey, cuntadaasoo lagu miisaamay kiiloogaraam. Xarriiqda jiiftaana waxay muujinaysaa maalmaha toddobaadka. Si dhakhso ah «Garaafkii» waxa laga arkayaa maalinta ugu cuntada badani inay ahayd Arbaca-

da. Xarriiq kasta dhererkeedu waxay u taagan tahay cuntada la bixiyey.

Tusaale 2 :

Shaxanka hoose waxa weeye garaaf jiidimeedka arday gashay sanadka kowaad sannaddadii 1967 ilaa 1971.

| Sannada | 1967 | 1968 | 1969 | 1970 | 1971 |
|----------------|------|------|------|------|-------|
| Tirada Ardayda | 6000 | 7000 | 8000 | 9000 | 10000 |



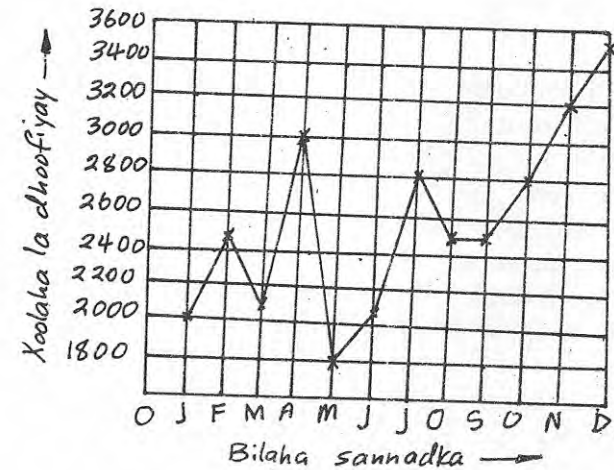
2. Garaaf Xarriiqeed.

Waa taynu nidhi garaaf jiidimeed waa garaaf jiidin isticmaalaya. Sidoo kale, «Garaaf xarriiqeed» waa garaaf isticmaalaya xarriiq. Xarriiqdu waxay tusaysaa waxa ka dhexeeya labada wax ee la doonayo in la arko siday isugu xidhan yihiin.

Tusaale :

Iskaashato xoolo dibadda u dhoofisa ayaa idahay dirtay sannadkii 1963 uu ahaa :

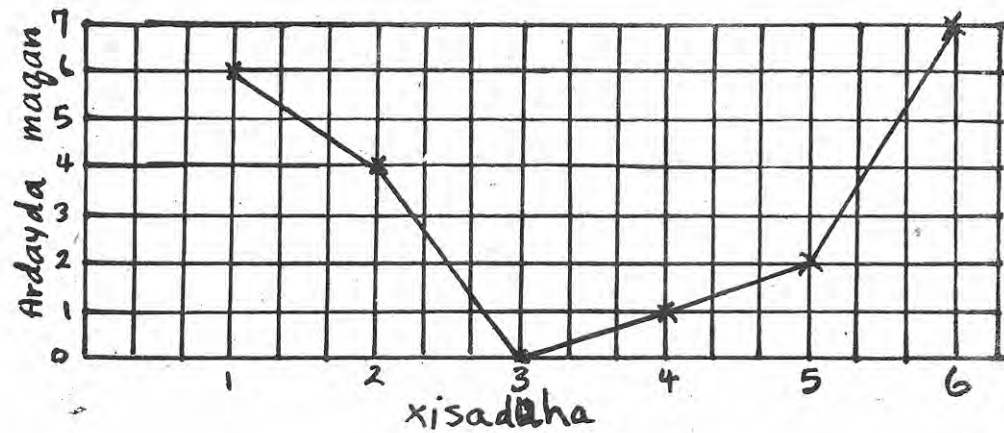
| | | | | | | |
|------|------|------|------|------|------|------|
| Jan. | Feb. | Mar. | Abr. | May | Jun. | Lul. |
| 2000 | 2500 | 2100 | 3000 | 1800 | 2100 | 2800 |
| Og. | Seb. | Okt. | Nof. | Dis. | | |
| 2500 | 2500 | 2800 | 3500 | 3500 | | |



Tusaale :

Dugsi ayaa maalintii leh lix xiisadood. Ardaydii xisaska ka maqnaatay waxay ahaayeen.

| Xisadaha | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------|---|---|---|---|---|---|
| Ardayda maqan | 6 | 4 | 0 | 1 | 2 | 7 |



Garaaf xarriiqeed wuxu wanaagsan yahay marka la rabo in si hawl yar uu u muuqdo isbeddelku. «Garaafka» hore wuxu markiiba ku tusayaa sida xoolaha diriddoodu marna ay kor ugu kacayeen marna hoos ugu dhacayeen. Sidoo kale «Garaafka» labaad waxa kaaga muuqanaya in maqnaanshaha ardaydu mararna yaraa mararna badnaa. «Garaafka» caynkan ihi wuxuu badanaa ku fiican yahay marka la damco in la arko, sida wax dhakhso isugu beddelaan.

Tusaaloyinka, waxaad ka arkaysaa in Garaaf xarriiqeed uu ka kooban yahay laba xarriiqood, midna taagan tahay, midna jiipto. Kulankoodu waa halkay labadoodu ka bilaabmaan oo la siiyo tirada eber. Qiyaas ayaa laga qaataa xariiq kasta, loomase baahna in labada qiyaasood isle'ekaadaan.

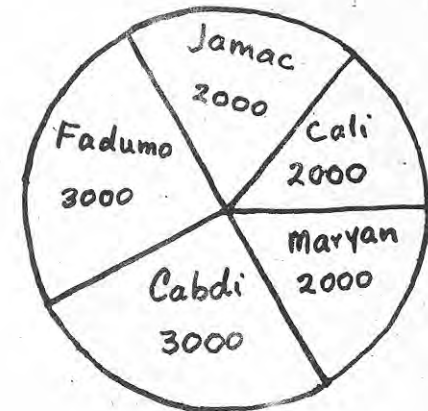
3. Gaaraf Goobo.

Sidaynu aragnay «garaaf jiiimeed» iyo «garaaf xarriiqeed» waxay tusaan xidhiidh ka dhexeeya laba wax. Mararka qaarkood waxa dhacda in loo baahdo in la arko ama la ogaado sida wax qudhihi dhawr meelood uu ugu kala baxay ama sida wax qudha dhawr meelood loogu qaybiyey. Kolka la doonayo in la muujiyo sida wax ay u sii kala baxeen, waxa la isticmaalaa goobo. Goobadoo dhammi waxay ka dhigan tahay waxa la qaybinayo. Inta meelood ee goobada loo jaje-biyey iyana waxay ku tusaysaa qaybtu sidey noqotay.

Tusaale :

Nin baa dhaxal ah 12,000 shilin uga tegay naagtiisi Faadumo iyo afartiisi carruura. Qofba wuxuu helay waxay ahayd:

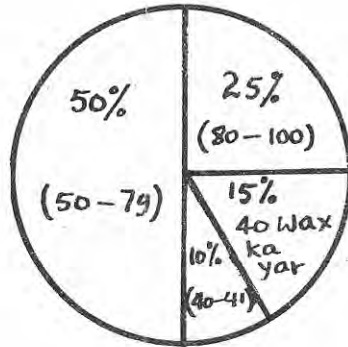
Faadumo: 3000 sh.; Cabdi 3000 sh.; Cali 2000 sh.; Maryan 2000 sh.; Jaamac 2000 sh.
Sida dhaxalkii loo kala helay waxay noqonaysaa sida ka muuqata halkan.



Qaybta markaad eegto, Faadumo iyo Cabdi waxay heleyaan dhaxalka badhkii, kolkaa goobada ayaa laba is le'eg loo qaybinayaa. Faadumo iyo Cabdi qaybtoodu waa is le'ek-tahay. Kolkaa goobada badhkeed oo laba loo sii qaybiyey ayuu qofkiiba helayaa labadooda. Taasu waxay la mid tahay, qofkiiba labadooda wuxuu heleyaa afareed dhaxalkii. Badhka qaybta ka soo hadhay Cali, Maryan iyo Jaamac ayaa si is-le'eg u kala qaatay. Kolkaa goobada badhkeed ayaa saddex is le'eg loo qaybinayaa.

Tusaale :

Imtixaan xisaab ah ayaa dadkii u fadhiistay 25% ay keeneen 80 — 100, 50% ay keeneen 50 — 79, 10% waxay keeneen 40 — 49. intii soo hadhayna waxay keeneen 40 wax ka yar.



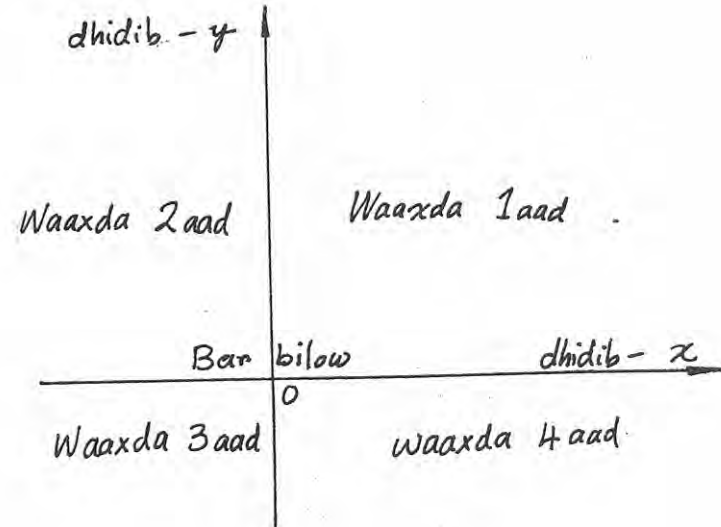
Goobada badhkeed wuxuu tusayaa intii keentay 50 — 79,

25% $\frac{1}{4}$ waa inta keentay 80 — 100. $\frac{1}{4}$ soo hadhay, 10% waa 40 — 49. 15% soo hadhayna 40 wax ka yar bay keeneen.

4. Kulammada Laydi iyo lammaanayaal horsan.

Kor waxaynu ku soo aragnay in «garaafyo» kala jaadaad ah lagu muujin karo laba wax xidhiidh ka dhexeeya. Garaafyadaa inkastoo la isticmaalo, haddana aad looma isticmaalo, waayo mararka qaarkood ayaanay hawl yarayn sida loo isticmaalayaa. Sidaa daraadeed waxa inta badan la isticmaalaa habka kulanka Laydi. Habka «garaafkan» waxa u sal ah laba xarriiqood oo isku qotoma. Xarriiqaha midi way jiiifta, ta kalana waxay ku qotontaa ta jiiifta. Xarriiqahan waxaynu

oran doonnaa **Dhidiby**. Ta jiiifta waxa weeye **dhidib X** ta taaganina waa **dhidib Y**.



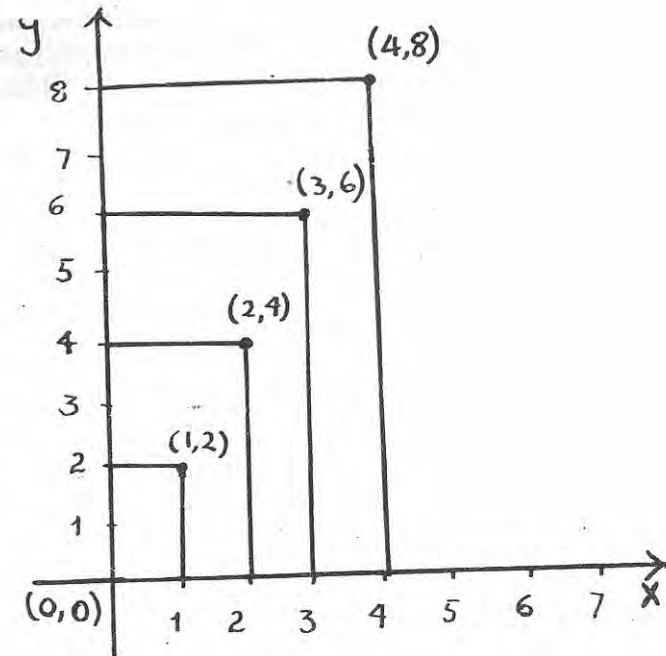
Marka aad qaadato laba xarriiqood oo isku qotoma, midna jiiifta midna taagan tahay, waxaad arkaysaa inay afar meelood oo isle'eg u kala oodayaan xaashida. Afarta meelood middiiba waxa la yidhaahaa waax. Waaxda midig ka xigta xarriiqda taagan kana korreysa ta jiiifta waxa la yidhaahaa: **waaxda kowaad**. Ta bidix ka xigta xarriiqda taagan kana korreysa ta jiiifta waxa la yidhaahaa waaxda labaad. Xarriiqda taagan waxa bidix ka xiga kana hooseeya ta jiiifta waxa la yidhaahaa: **waaxda saddexaad**. Ugu dambeystii inta midig ka xigta xarriiqda taagan kana hoosaysa ta jiiifta waxa la yidhaahaa: **waaxda afraad**. Labada xarriiqood halkay ku kulmaanna waxa la yidhaahaa: **bilow**.

Marka la doonayo in la muujiyo meel ka mid ah waaxaha, waxa loo baahan yahay in la ogaado inta hore (dib) looga kacayo bilowga iyo inta kor (hoos) looga kacayo xarriiqda jiiifta. Ka dhig inaynu haysanno tusahan :

| Saacad | Geeddi (km.) |
|--------|--------------|
| 0 | 0 |
| 1 | 2 |
| 2 | 4 |
| 3 | 6 |
| 4 | 8 |

Tusahanu wuxuu muujinayaa fogaanta la jarey saacadaha meesha ku yaal. Haddii laba laba aynu isugu qaadno, tusuhu wuxuu noqonayaa $(0, 0)$, $(1, 2)$, $(2, 4)$, $(3, 6)$, $(4, 8)$.

Tirooyinka hore ee lammaane kasta waa saacadaha, kuwa dambena waa fogaanta. Iyagoc «garaafka» lagu muujiyeyna waa kuwan



Bar muujiskeedu wuxu ku xidhan yahay inta hore loo soconayo iyo inta kor loo kacayo. Haddii loo baahdo in la muujiyo $(2, 4)$, kolkaa bilowga ayaa 2 hore looga kacayaa, kolkaa, ayaa xarriiq taagan la sameynayaa, bilowgana waxa kor looga kacayaa 4, kolkaa, ayaa xarriiq jifta la jeexayaa. Xarriiqda taagan iyo taa jiftaa halkay ku kulmaan ayaa noqonaysa $(2, 4)$. Habka caynkan ah waxa la yidhaahaa **kulanka** laydi waayo xarriiqaha jiifa iyo kuwa taagan ayaa «laydi» samaynaya.

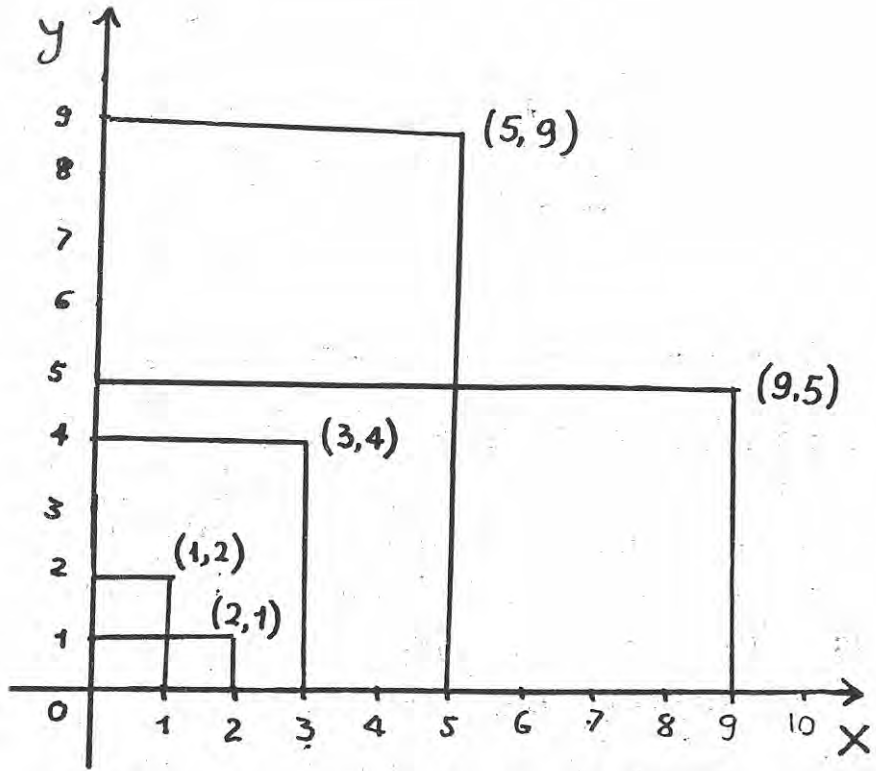
5. Lammaaneyaal horsan.

Haddii laba tiro aad haysatid, kolalka qaarkood sida ay u soo kala horreeyaan macna weyn ayay leedahay. Tusaale ahaan waxaad ka soo qaaddaa in lagu siiyey $(5, 12)$. Haddii tirada soo horraysaa ay tahay qalimo, ta dambena ay tahay buugag, kolka $(5, 12)$ waxay tahay shan qalin iyo toban iyo laba buug. Haddii aad qorto $(12, 5)$, kolkaa waxay noqonaysaa laba iyo toban qalin iyo shan buug. Waxaad kolkaa ar-

kaysaa inaanay (12, 5) iyo (5, 12) isku jaad ahayn. Tirooyinka caynkaas ah ee sida ay u soo kala horreeyaan ay tahay lagama maarmaan waxa la yidhaahaa lammanayaal horsan. Marka la damco in «garaaf» lagu muujiyo lammanayaal horsan mar kasta tirada soo horraysa waxa muujiya dhidibka jiifa, ta dambena wax lagu muujiyaa dhidibka taagan.

Tusaale :

«Garaaf» ku muuji (1, 2), (3, 4), (2, 1), (5, 9), iyo (9, 5).



Halkaa waxa ka cad in (2, 1) iyo (1, 2) ay kala jaad yihiin ama (9, 5) iyo (5, 9) iyana ay kala duwan yihiin.

Layli :

A. Mas'alooyinka 1 — 5 waxaad ku muujisaa «garaaf jiitimeed».

1. Cusbataal dadka iska daweeeyey muddo toddobaad ah waxay ahaayeen.
Sabti: 120, Axad: 150, Isniin: 90, Talaada: 100
Arbaca: 130, Khamiis: 200, Jimce: 60.
2. Dugsi lix xiisadood maalintii gala, ardayda xisadaha ka maqnayd waxay ahaayeen:

| | | | | | | |
|---------------|----|----|---|---|---|----|
| Xisaska | 1 | 2 | 3 | 4 | 5 | 6 |
| Ardayda magan | 25 | 20 | 5 | 6 | 8 | 18 |

3. 1950kii ilaa 1962dii roobkii helay magaalo A wuxuu ahaa:

| | | | | | | | |
|------|-------|-------|-------|------|-------|------|-------|
| 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 |
| 37" | 33" | 40" | 36.5" | 38" | 41.5" | 30" | 39.5" |
| 1958 | 1959 | 1960 | 1961 | 1962 | | | |
| 55" | 39.5" | 38.6" | 37.6" | 40" | | | |

4. (a) Dhererka Cali, Jaamac, Maxamed, Faadumo, iyo Guuleed waa 1.65 m., 1.75 m., 2.1 m., 1.71 m., 1.54 m.

(b) Miisaanka dadkaasuna waa:

65 kg. 68 kg. 60 kg. 80 kg. 54 kg.

5. Dekedda Berbera xoolihii ka dhoofay muddo sannad ah waxay ahaayeen :

| | | | | | | |
|------|------|------|------|------|------|------|
| Jan. | Feb. | Mar. | Abr. | May | Jun. | Lul. |
| 4500 | 6000 | 5600 | 5500 | 5600 | 5000 | 5400 |

- Og. Seb. Okt. Nof. Dis.
- 4800 5000 6000 7800 9000
- B. Mas'alooyinka 6 — 10 «garaaf xarriiqeed» ku muuji.
6. Dhakhtar ayaa dadkuu arkay muddo toddoba cisho ay ahaayeen.
- Sabti: 40, Axad: 38, Isniin: 39, Talaada: 42, Ar-baca: 45, Khamiis: 50, Jimce: 0.
7. Qaado roobka mas'alada 3aad.
8. Dugsi 700 oo caruur ihi wax ka barato, muddo bil ah maqnaanshihii carrurtu waa sida tusahan ku taal.
- | | | | | | | |
|-------------|-----|----|----|----|----|----|
| Xiisadda | 1 | 2 | 3 | 4 | 5 | 6 |
| Waxa maqnaa | 120 | 80 | 90 | 70 | 50 | 30 |
9. Magaalada Xamar maalin maalmaha ka mid ah qiyaasta kuleylaheedu wuxuu ahaa:
- | | | | | | | |
|------|------|------|-------|-------|-------|------|
| 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 1.00 |
| 71°F | 73°F | 75°F | 76°F | 75°F | 80°F | 84°F |
| 2.00 | 3.00 | 4.00 | | | | |
| 69°F | 77°F | 70°F | | | | |
10. Qaado tirooyinka mas'alada shanaad.
- T. Mas'alooyinka 11 — 15 waxaad ku muujisaa «Garaaf goobo».
11. Dukaan lacagta soo gashaa bishii waxay ka timaadaa: — shaarar, — kabo, — cunto, — wax kale.
- | | | | |
|---|----|---|----|
| 1 | 1 | 3 | 5 |
| 4 | 16 | 8 | 16 |
12. Dugsi 500 wax ka dhigtaan ayaa horjooqe doortay. Doorashadii siday u dhacday waxay ahayd. Cumar: 200, Maxammed: 150, Cabdi: 100, Axmed: 50.

13. Wasaaradda Waxbarashadu sannad lacagteeda siday u bixisay waa sida soo socota:
- 40% mushahaaro, 25% buugaag, 10% cuntada dugsiyada, 15% xafiisyadeeda, 5% dugsiyada ha-gaajistooda, 5% waxyaabo kale.
14. 200 Shilin ayaa 5 qof loo qaybiyey. Siday qaybaha u kala heleen waa 60/—, 50/—, 40/—, 30/— iyo 20/—.
15. Reer ayaa xabbad keeg ah kala qaybsaday, carrurtii laba waxa la siiyey midkiiba $\frac{1}{12}$, midna $\frac{1}{6}$, midna $\frac{1}{4}$, carruurta aabahood iyo hooyadoodna waxay isku qaateen $\frac{5}{12}$.
- J. Mas'alooyinka 16 — 20 waxaad ku muujisaa habka kulanka laydi. Mas'ala kasta Garaaf qudh ah u samee.
16. b. (2, 3) t. (4, 6) j. (0, 0).
17. i. (1, 1) ii. (-2, 2) iii. (-2, -2) iv. (2, -2) v. (1, -1) vi. (-1, 1) vii. (-4, -4).
18. b. (700, 1000) t. (800, 1200) j. (900, 15000) x. (1000, 2000).
20. b. (5, 0) iyo (0, 5) t. (0, -5) iyo (-5, 0) j. (6, 1) iyo (1, 6) x. (-3, 8) iyo (-8, -3)

21. Tusahan habka Garaaf laydi ku muuji :

| | | | |
|----|----|----|----|
| -5 | -5 | -4 | 16 |
| -4 | -4 | -3 | 9 |
| -3 | -3 | -2 | 8 |
| -2 | -2 | -1 | 1 |
| -1 | -1 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 1 | 1 | 2 | 9 |
| 2 | 2 | 3 | 9 |
| 3 | 3 | 4 | 16 |
| 4 | 4 | 5 | 25 |
| | | 6 | 36 |

Isku xidh barahaad sameysay.