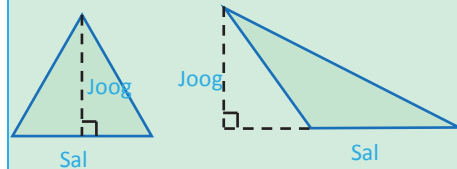


CUTUBKA 5^{AAD}



SHAXANNADA JOOMATERIGA IYO CABBIRAADAHA

U Jeedooyinka Cutubka:

Cutubkani kolka uu dhammaado ka dib, waxaad awood u yeelan doontaa inaad:

- soo soocdo dhisto islamarkaana sharaxdo astaamaha afardhinacleyaasha sida, koor iyo barbarooleyaasha.
- kala soocdo faraqa u dhexeeya geesooleyaasha tuurta leh iyo geesooleyaasha golxada leh.
- soo saarto wadarta xaglo gudeedyada geesooleyaasha tuurta leh.
- soo saarto wareegyada iyo bedadka saddexagalda iyo kooraha iyo goobooyinka.
- soo saarto cabbirada qaybaha biriisamyada iyo dhululbooyinka.

Tusmooyinka muhiimka ah:

5.1 Afardhinacleyaal, Geesooleyaal iyo Goobooyin

5.2 Aragtiinnada saddexagalada

5.3 Cabbiraadaha

Erayada muhiimka ah

Soo koobid

Laylisyo guud

HORDHAC

Xisaabta fasalka lixaad waxaad ku soo barateen noocyo kala duwan iyo astaamaha qaar ka mid ah shaxanada joomateriga, asaaska dhisitaanada joomateriga iyo cabbiraadaha. Cutubkan waxaad ku xoojin doontaan aqoontiinii hore islamarkaana waxaad ugu sii korodhisin doontaan barashada shaxanada joomateriga sida afargeeslayaasha. Geesoolayaasha iyo goobooyinka dhisidooda, astaamahooda iyo cabbiraadooda.

5.1 AFARDHINACLEYAASHA, GEESOOLEYASHA IYO GOOBOOYINKA

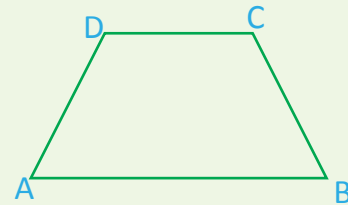
5.1.1 Afardhinacleyaasha

Ka hor inta aynaan qeexin afardhinacle, waa inaad ka shaqeysaan hawlgalka soo socda kaasoo si fudud idinka caawinaya in aad u fahamtaan afardhinacle waxa u yahay.

Hawlgal 5.1

B Guuri [shaxanka 5.1](#) islamarkaana ka shaqee su'aalaha soo socda:

- 1 Imisa dhinac ayuu leeyahay?
- 2 Sharax dhinacyada?
- 3 b. U magac bixi shaxanka
t. Waa maxay magaca guud ee shaxanku
- 4 Calaamadee xaglaha gudaha.
- 5 Qor dhinacyada lamaanayaasha ah ee iska soo horjeeda.
- 6 Qor dhinacyada lamaanayaasha deriska ah.
- 7 Sawir xaglo-gooyeyaasha
- 8 Haddii $\overline{AB} // \overline{DC}$ kolkaa maxaad ku magacaabi shaxanka?



Jaantuska 5.1

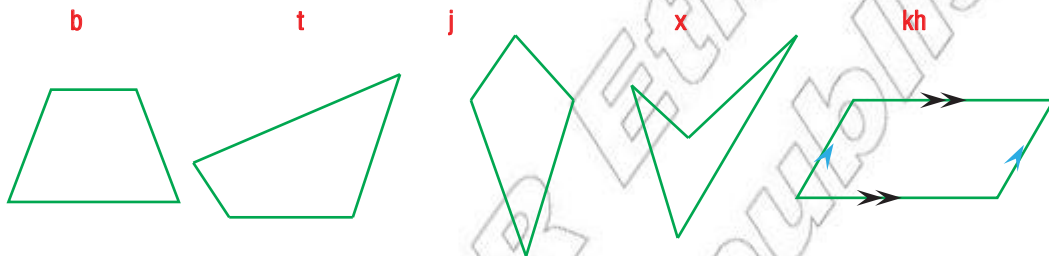
T Sharax mid walba fekradaha soo socda adigoo adeegsanaya ereyadaada ama sida aad u qabto in ay yihiin islamarkaana la falanqee saaxiibadaa.

- b** afardhinacle
- t** dhinacyada afardhinacle.
- j** dhinacyada deriska ah ee afardhinacle
- x** dhinacyada iska soo horjeeda ee afardhinacle

- kh** xaglo-gooyeyaasha afardhinacle.
d xaglo gudeeyada afardhinacle.
J b faahfaahi tibxida koor
t adiga oo sawiraya koor muuji
i salalka koorta **ii** adimada koorta **iii** joogga koorta.

- **Dib u xasuuso in afardhinacle yahay shaxan afardhinac leh si fudud oodan**

Tusaale 1: Shaxanada soo socda waxay u taagan yihiin qaar ka mid ah tusaalayaasha afardhinacleyaasha.



Jaantuska 5.2

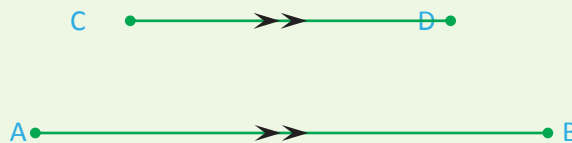
B. Dhisidda iyo astaamaha koorta

Fasalkii lixaad waxaad ku soo barateen sida loo dhiso saddexagalada loo adeegsanayo mastarad, xagal-beege iyo lamaanayaah goobeeye. Cutub hoosaadkan waxaad ku arki doontaa faahfaahinada iyo dhisitaanada koorta iyo afardhinacleyaal kaloo gaar ah.

Hawlgal 5.2

Qalabka loo baahan yahay: mastarad, xagal-beeg goobeeye,

- b** dhis xariijimaha \overline{AB} iyo \overline{CD} halka $AB = 8 \text{ cm}$, $CD = 5 \text{ cm}$ islamarkaa $\overline{AB} // \overline{CD}$, sida ka lagugu siiyey [Jaantuska 5.3](#).
- t** isku xidh baraha A ilaa C islamarkaana B ilaa D
- j** falanqee samayska afardhinaclaha.

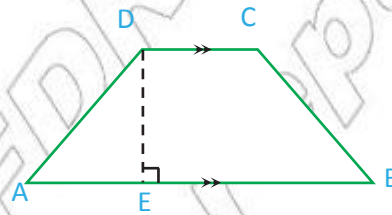


Jaantuska 5.3

- 2 Dhis koorta PQRS halka $\overline{RS} // \overline{PQ}$ iyo $QR = 2\text{ cm}$, $PQ = 4\text{ cm}$ $m(\angle P) = 45^\circ$; $m(\angle Q) = 70^\circ$ adiga oo adeegsanaya talaabooyinka dhisitaanka ee soo socda
- b** sawir xariijin \overline{PQ} islamarkaana $PQ = 4\text{ cm}$
- t** ku dhis $\angle P$ iyo $\angle Q$ cabbirada lagu siiyey
- j** muuji barta R islamarkaana $QR = 2\text{ cm}$
- x** dhis xagasha TRS islamarkaana $m(\angle TRS) = 70^\circ$ ee ku dul dhaca QT
- kh** isku xidh P ilaa S islamarkaana S ilaa R.
- 3 Faahfaahi qeybaha koorta lagu dhisay kor ee 1 iyo 2 Afardhinaclaha aad kor ku soo dhiseen waxaa lagu magacaabaa koor. Guud ahaan, koorta waxaa loo qeexaa islamarkaana loo hanaaniyaa sida soo socota.

Qeex 5.1: Koor waa afardhinacle ay barbarro yihiin mid ka mid ah lamaanayaasha dhinacyada iska soo horjeeda.

Jaantuska 5.4 $\overline{AB} // \overline{DC}$ halka $\overline{AD} \nparallel \overline{BC}$ kadib afargeeslaha ABCD waa koor' halka:



Jaantuska 5.4

- ◆ Dhinacyada barbaraha ah \overline{AB} iyo \overline{CD} waa salal
- ◆ Dhinacyada aan ahayn barbaraha \overline{AD} iyo \overline{BC} waa addimo
- ◆ \overline{DE} waa joogga ama qotonka

Ogow: Koorta dhinacyada aan barbaraha ahayn ay isku sorgoan yihiin waxa lagu magacaabaa koor labaale ah.

Laylis 5.1

- 1 Ku qor run haddii hawraarta lagu siiyay sax tahay ama been haddii ay tahay qalad.
- b** Shaxan kasta oo leh afar dhinac waxaa lagu magacaabaa afardhinacle
- t** Dhamaan afargeeslayaashu waxay leeyihiin laba xagalo –gooye
- j** Xaglo-gooyeyaasha koor kasta way isku sargo'an yihiin.

- x** Afargeeslaha labadiisa dhinac ee wadaaga bar dhamaad waxaa lagu magacaabaa dhinacyo deris ah.
- kh** Salka hoose ee koortu mar walba wuu ka wayn yahay salka sare.
- d** Xagal-gooyaha afargeesle wuxuu u qeybiyaa afargeeslaha laba sadexgal oo isku sargo'an.
- r** Addimada koortu waa la barbaro midba midka kale .
- s** Xaglaha salka ee koorta labaalaha ah way isku sargo'an yihiin
- sh** Xaglo-gooyeyaasha koorta labaalaha ah way isku sargo'an yihiin
- 2** Imisa sal ayey koortu leedahay?
- 3** Koorta xaglaha salka ee lamaanayaasha ah waa 120° iyo 150° , raadi cabbirka xaglaha kale.
- 4** Koorta labaale ABCD, haddii mid ka mid ah xagal saleedyada tahay 70° . Raadi cabbirka xaglaha kale?
- 5** Dhis koorta EFGH ee $\overline{EF} // \overline{GH}$ isla markaana $\overline{EF} = 6\text{cm}$, $\overline{FG} = 3\text{cm}$, $m(\angle E) = 60^\circ$ iyo $m(\angle F) = 55^\circ$?
- 6** Dhis koorta ABCD halka $\overline{AB} // \overline{CD}$ isla markaana $\overline{AD} = 4\text{cm}$, $m(\angle D) = 70^\circ$ $\overline{DC} = 11\text{cm}$ iyo $m(\angle C) = 85^\circ$?

T. Dhisidda iyo Astamaha Barbaroolaha

Waxaad horey u soo barateen afargeesle waa shaxan afardhinacle si fudud u oodeen. Iminka waxaad faahfaahisaan fekrada afardhinaclaha nooca gaar ah oo la yidhaa barbaroole iyo dhisidda barbaroole leh cabbirada adimada lagu siiyey.

Hawlgal 5.3

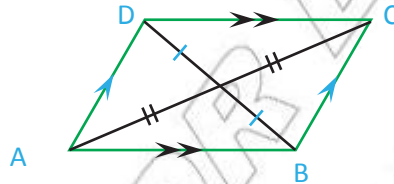
- 1** Maxaan ula jeednaa marka aan leenahay laba xaglood waa xaglo is buuxsha/isdhameeya?
- 2** Dhig laba qalabka jibbaarma ah oo $30^\circ - 60^\circ - 90^\circ$ oo Magacow shaxanka ay sameeyaan.
- 3** Faahfaahi qaabka barbaroole.
- 4** Adiga oo adeegsanaya mastarad, xagal-beege iyo lamaanayaal goobeeye ah dhis barbarooleha DEFG halka $DE = 6\text{cm}$, $EF = 4\text{cm}$, $m(\angle D) = 65^\circ$ adiga oo adeegsanaya talaabooyinka soo socda:
 - b** Sawir xariijin \overline{DE} isla markaana $DE = 6\text{cm}$
 - t** Dhis $\angle D$ halka $m(\angle D) = 65^\circ$ isla markaana $\angle E$ cabbirkiisu waa 115°
 - j** Muuji barta F isla markaana $EF = 4\text{cm}$
 - x** Dhis $\angle EFG$ isla markaana $m(\angle EFG) = 65^\circ$ (halka G ay tahay isgoyska \overline{DG} iyo \overline{FG})

- kh** Miyaad heshay barbaroolaha DEFG ee aad raadinaysay ?
- d** Barbaroolaha DEFG,maxaad odhan kartaa .
- i** Dhinacyada iska soo horjeeda ?
- ii** Xaglaha iska soo horjeeda?
- iii** Xaglaha deriska ah?
- iv** Xaglo gooyeyaasha?

Hawlgalka sare ayaa wuxuujaasiinayaa war waxtar u leh qeexitaanka barbaroole.

Qeex 5.2: Barbaroole waa afardhinacle ay laba dhinac kastoo iska soo horjeeda ay barbaro yihiin.

Jaantuska 5.5 $\overline{AB} // \overline{DC}$ iyo $\overline{AD} // \overline{BC}$, kolkaa ABCD waa barbaroole



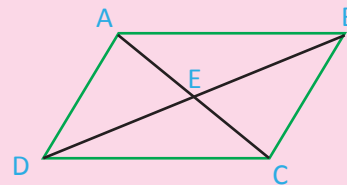
Jaantuska 5.5

Astaamaha barbaroolaha

- 1 Dhinacyada iska soo horjeeda ee barbarooluhu way isku sargo'an yihiin
- 2 Xaglaha iska soo hor jeedaa ee barbarooluhu way isku sargo'an yihiin
- 3 Xaglaha isku xiga ee barbarooluhu waa xaglo isbuuxsha
- 4 Xaglo gooyeyaashu way iskala badhaan midba midka kale.

Laylis 5.2

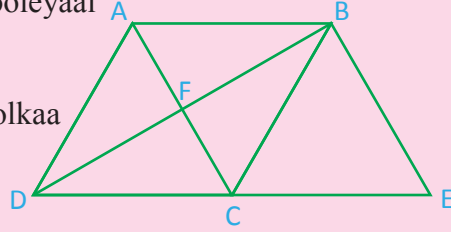
- 1 Haddii hal xagal ee barbaroolaha ABCD tahay 65° , kadib raadi cabbirka xagalaha kale.



Jaantuaka 5.6

- 2 Shaxanka lagu tusay ee ABCD waa barbaroole. Haddii xaglo gooyeyaasha \overline{AC} iyo \overline{DB} ay ku kulmaan E islamarkaana $\overline{DB} = 6\text{cm}$, raadi dhererka \overline{EB} .

- 3 Shaxanka, ABCD iyo ACED waa barbarrooleyaal
Xaglo-gooyeyaasha \overline{AC} iyo \overline{DB} ee ABCD
Waxay Ku kulmaan F, Hadii $CF = 4\text{cm}$, kolkaa
raadi BE



Jaantuska 5.7

- 4 Barbarroolaha ABCD, cabbirka xagasha A waa x digrii islamarkaana
cabbirka xagasha B waa $(2x-30)$ digrii, raadi cabbirka xagasha B
- 5 Barbarroolaha ABCD, $m(\angle ABC) = 3x-12$ islamarkaana $m(\angle CDA) = x + 40$,
raadi $m(\angle ABC)$, $m(\angle CDA)$, $m(\angle BCD)$ iyo $m(\angle DAB)$
- 6 Barbarroolaha ABCD, $AB = 7x-4$, islamarkaana $CD = 2x+21$, raadi \overline{AB} iyo
 \overline{CD}
- 7 Dhis barbarroolaha ABCD oo ay $AB = 8\text{ cm}$, $BC = 5\text{ cm}$ islamarkaana
 $m(\angle A) = 70^\circ$
- 8 Dhis barbarroolaha ABCD halka $AB = 7\text{ cm}$, $\angle B = 110^\circ$ islamarkaana
 $\overline{BC} = 4\text{ cm}$

J. Dhisida iyo astaamaha barbarroolayaasha khaaska ah

Afardhinacleyaasha, laydi, qardhaas, iyo laba jibaarane waa barbarrooleyaal khaas ah, maadaama oo mid waliba buuxinayo dhamaan astaamaha barbarroolaha.

Dhisitaanka laydiyada, qardhaasaha iyo labajibaaranuhu waxay lamid yihiin oo ay noqonayaan ta barbarroolaha oo wax yar faahfaahsan, si aad isugu daydo, ka shaqee hawlgalka soo socda.

Hawlgal 5.4

- 1 Waa maxay laydi?
- 2 Laydigu ma barbarroolaa?
- 3 Waa maxay labajibaarane?
- 4 Dhis laydiga ABCD ee $AB = 6\text{ cm}$ iskamarkaana $BC = 4\text{ cm}$
- 5 Dhis qordhista PQRS ee $PQ = 4\text{ cm}$ islamarkaana $\angle P = 85^\circ$
- 6 Dhis labajibaaranaha KLMN ee $KL = 5\text{ cm}$.

Shaqo kooxeed 5.1

Ka shaqee mid kasta kuwa soo socda, adiga oo la wadaagaya fekradaada kooxdaada dhaxdeeda.

- 1 Sidee ayaad u wada xidhiidhin

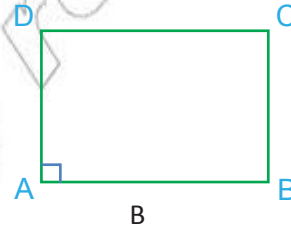
b labajibbaarane iyo qardhaas	t labajibbaarane iyo laydi
j Laydi iyo qardhaas	x qardhaas iyo abitooy
kh Qardhaas iyo barbarroole.	
- 2 Maxaad fekrad ahaan ka odhan kartaa

b xaglo –gooyeyaasha laydiga	
t xaglo-gooyeyaasha qardhaasta	
j xaglo–gooyeyaasha labajibbaaranaha	
x xaglo-gooyeyaasha koorta	
- 3 **b** magacaw saddex afardhinacleyaal oo ah barbarroole
t magacaw laba afardhinacle aan ahayn barbarroole
- 4 Tus xidhiidhka ka dhaxeeya noocyada kala duwan ee afardhinacleyaasha adiga oo adeegsanaya tusaha Feyn.

Laydi

Qeex 5.3: laydi waa barbarroole leh xagal qumman

Jaantuska 5.8 $m(\angle A)=90^\circ$ sidaas awgeed barbarroolaha ABCD wuxuu u taagan yahay laydi



Jaantuska 5.8

Astaanmaha laydiga

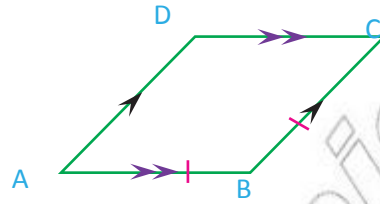
- 1 dhinacyada iska soo horjeeda ee laydigu waa barbaro, wayna isku sargo'an yihiin
- 2 xaglo-gooyeyaasha laydigu way is kala badhaan midba midka kale
- 3 dhamaan xaglaha laydigu waa xaglo quman
- 4 xaglo-gooyeyaasha laydigu way isku sargo'an yihiin

Qardhaas

Qeex 5.4: Qardhaas waa barbarroole labada dhinac ee deris ka ah ay isku sargo`an yihiin.

Jaantuska 5.9 ABCD waa barbarroole halka

$\overline{AB} \equiv \overline{BC}$ markaa ABCD waa qardhaas.



Jaantusk 5.9

Astaanta qardhaasta

- 1 dhinacyada iska soo horjeeda ee qardhaastu waa barbaro, wayna isku sargo'an yihiin.
- 2 xaglo-gooyeyaasha qardhaastu way iskala badhaan midba midka kale.
- 3 dhamaan dhinacyada qardhaastu way isku sargo'an yihiin.
- 4 Xaglo-gooyeyaasha qardhaastu way isku qotomaan midba midka kale.
- 5 Xaglo-gooyeyaasha qardhaastu waxay kala badhaan xaglaha geesaha.

Labajibaarane

Qeex 5.5: Labajibaarane waa qardhaas leh xagal qumman ama laba jibaarane waa laydi dhinacyadiisa deriska ah ay isku sargo'an yihiin.

Astaamaha laba jibbaaranaha

- 1 Laba jibbaaranuhu waa barbaroole kolkaa
 - b** dhinacyada iska soo horjeeda waa barbaro wayna isku sargo'an yihiin
 - t** xaglaha iska soo horjeeda way isku sargo'an yihiin
 - j** xaglo-gooyeyaashu midba midka kale ayuu u kala badhaa
- 2 Laba jibbaaranuhu waa qardhaas, islamarkaana
 - b** xaglo-gooyeyaashu way isku qotomaan.
 - t** xaglo-gooyeyaashu waxay kala badhaan xaglaha geesaha.
- 3 Labajibaaranahu waa laydi islamarkaana.
 - b** xaglo-gooyeyaashu way isku sargo'an yihiin
 - t** dhamaan xagluhu waa xaglo quman.

Laylis 5.3

- 1 Laydiga ABCD, dhererka xagalgooyaha AC waxa u taagan $6x - 2$ islamarkaana dhererka xagal gooyaha BD waxaa u taagan $4x + 2$.
 - b** raadi qiimaha x
 - t** raadi AC, BD iyo AB
- 2 Laydiga ABCD, xaglo-gooyeyaasha AB iyo BC waxay iska gooyaan E, Haddii $AE = 3x + y$, $BE = 4x - 2y$ islamarkaana $CE = 20$, raadi x iyo y

- 3** Barbaroolaha ABCD, $AB = x + 4$, $DC = 3x - 39$ islamarkaana $BC = 2x - 16$ tus in ABCD u yahay qardhaas.
- 4** Ku qor run haddii hawraarta lagu siiyey sax tahay ama been haddii ay tahay qalad.
- b** laydigu waa qardhaas **t** Qardhaastu waa laydi
- j** Barbarooluhu waa qardhaas **x** Barbarooluhu waa laydi
- kh** Haddii xaglo-gooyeyaasha afargeesle ay isku qotomaan midba midka kale kolkaa inuu noqdo qardhaas waa lagama maarmaan.
- d** Xaglo-gooyeyaasha qardhaastu waxaa ay sameeyaan afar saddexagal oo isku sargo'an
- r** xaglo-gooyeyaasha labajibbaaranuhu waxay isku kala badhaan si qotome ahaan ah.
- s** Qardhaas kastaa waa labajibbaarane
- sh** Xaglo-gooyeyaasha waxay u qaybshaa labajibbaaranaha , afar saddexagal labaale ah oo isku sargo'an.
- dh** Haddii bar-badhtameeyada dhinacyada laba jibaaranaha la kulansiiyo, waxaa ka samaysma labajibbaarane kale.
- 5** Dhis qardhaasta ABCD leh $AB = 6\text{cm}$ islamarkaana $m(\angle A) = 70^\circ$
- 6** Dhis laydiga PQRS leh $PQ = 8\text{cm}$ islamarkaana $QR = 10\text{ cm}$
- 7** Dhis laba jibbaaranaha ABCD leh $AC = 6\text{ cm}$

5.1.2 Geesoolayaasha

Fasaladii hore iyo qeybihii hore waxaad garawsateen in shaxanka si sahlan saddexda dhinac u oodeen lagu magacaabo saddexagal, shaxanka sahlan ee afardhinaclaha si fudud u oodan waxaa lagu magacaabaa afar-geesoole, Si lamid ah taas waxaad heli kartaa shaxan sahlan ee shan dhinaclaha oodan, shaxanka sahlan ee lix dhinaclaha oodan islamarkaad sii socda noocyada. Shaxanadan sida noocyadan ah ee sifudud ugu samaysma xariijimaha waxaa lagu magacaabaa geesoolayaasha.

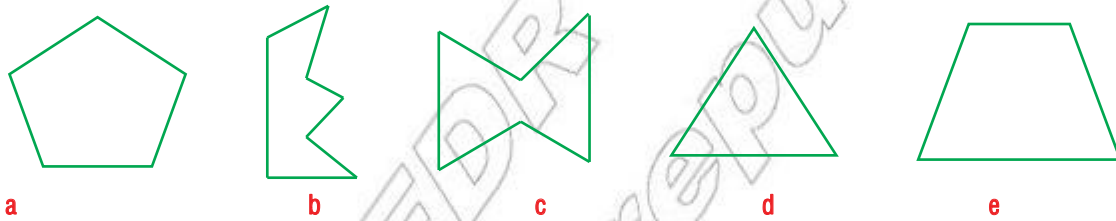
Hawlgal 5.5

- 1** Ku keen qeexda, geesoole erayadaada,
- 2** Maxaad ugu yeedhi, shaxan oodan oo ka samaysan saddex xariijimood ama kabadan?
- 3** Sheeg tusaale ah shaxan si fudud u oodan oo aan ahayn geesoole.

- 4** U fiirso labada barood A iyo B meelkasta geesoolaha dhexdiisa. Marka aan isku xidhno A iyo B, xariijin ahaan, xariijinta \overline{AB} waxay ku dhacaysaa geesoolaha dhexdiisa.
- b** sawir saddex geesoole oo kala duwan oo run ka dhigaya hawraarta sare,
t miyaad garan magaca geesoolaha sidan ah? muxuu yahay.
- 5** U fiirso labada barood D iyo E ee geesoolaha dhaxdiisa marka aan isku xidhno labadaas barood, waxaa suurogal ah xariijinta \overline{DE} in ayna ku dul dhicin dhamaanteed geesoolaha.
- b** sawir saddex geesoole kuwaas oo run ku noqonaya hawraarta sare.
t miyaad garanaysaa magaca geesoolaha runta ku noqonaya hawraarta sare? Waa maxay magacaasi?

Qeex 5.6: Geesoole waa hilin si fudud ay u oodeen xariijimo

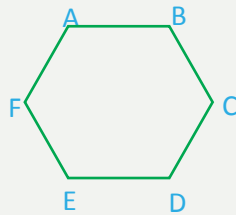
Shaxannada soo socda waxay u taagan yihiin qaar ka mid ah tusaalayaasha geesoolayaasha.



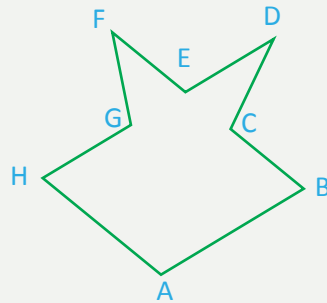
Jaantuska 5.10

Ogow: geesoole tuur leh waa geesoole ay cabbirka xaglo-gudeedyadiisu mid walba u ka yar yahay 180° .

t geesoole golxo leh waa geesoolaha leh ugu yaraan hal xaglo-udeed oo cabbirkeedu ka wayn tahay 180° .



Jaantuska 5.11



Jaantuska 5.12

Jaantuska 5.11:geesoole tuur leh geesoolaha tuuta leh: (mid walba cabbirka xagal kastaa way ka yar tahay 180°)

Jaantuska 5.12: Geesoole golxo leh: (xaglo gudeedyada G, E iyo C mid kast wuu ka wayn yahay 180°)

Ogow: Ereyga Geesoole waa in loo fahmo in loo tixraaco geesoole tuur leh. Abla-ablaynta geesooleyaasha iyadoo loo eegayo tirada geesahooda.

Tirada dhinacyada	Magaca geesoolaha
3	Saddex geesle
4	Afar geesle
5	Shan geesle
6	Lix geesle
7	Todoba geesle
8	Siddeed geesle
9	Sagaal geesle
10	Toban geesle
n	n-geesle

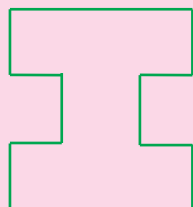
Ogow: Geesoolaha dhamaan dhinacyadiisu iyo xaglihiisu ay isku sargo'an yihiin waxaa lagu magacaabaa geesoole qaabsan.

Tusaale1:

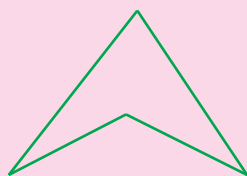
- b** saddexagal siman waa saddexagal qaabsan
- t** laba jibaaranuhu waa afargeesle qaabsan

Laylis 5.4

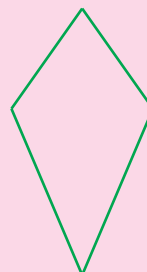
- 1 waa maxay geesoolaha ugu fudud?
- 2 U kala sooc geesoolayaasha soo socda sida geesoolayaasha golxo leh ama geesoolayaasha tuur leh.



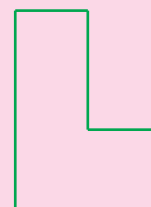
b



t



j



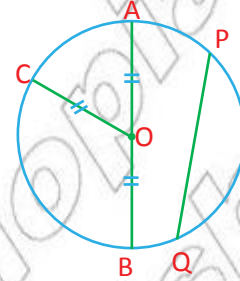
x

Jaantuska 5.13

Qeexaha 5.7: Goobo waa ururka baraha fogaan isku mida u wada jira bar maguuraan ah oo la yidhaa xuddunta goobo.

Jaantuska 5.14 dhexdiisa

- ✚ O waa xuddunta goobada
- ✚ \overline{OA} , \overline{OB} iyo \overline{OC} waa gacamada goobada
- ✚ \overline{PQ} iyo \overline{AB} waa boqonada goobada
- ✚ \overline{AB} waa dhexroorka goobada
- ✚ PAC , PQB , ACB waa qaansooyinka goobada.



Jaantuska 5.14

Laylis 5.5

- 1 Ku qor run haddii hawraarta lagu siiyey sax tahay ama been haddii ay tahay qalad.
 - b Haddii boqon uu u qeybiyo goobada laba qaybood oo isle'eg kolkaa wuxuu noqonayaa dhexroorka goobada,
 - t dhexroorka goobooyinka isku mid ah way isku sargo'an yihiin .
 - j laba boqon oo kasta oo goobo isku mid ah way isku sargo'an yihiin.
 - x goobadu waxay yeelan kartaa dhexrooro badan
 - kh boqonada isku sargo'an ee hal goobo waxay fogaan isle'eg u jiraan xuddunta goobada
 - d dhexroorku waa boqonka ugu dheer goobada .
 - r gacanku waa badhka dhexroorka goobada.
- 2 Gooba leh gacan 4 cm ah
 - b sawir boqon ah 4 cm
 - t sawir boqon ah 8 cm, maxaad ka odhan kartaa boqonkan?
 - j ma ku sawiri kartaa boqon ah 9 cm?

5.2 ARAGTIINADA SADDEXAGALLADA

Cutub-hoosaadkan, aragtiinka wadarta xaglaha iyo aragtida xagalo dibadeedka saddexagal ayeynu. ku sharixi islamarkaa aynu ku caddeyn.

5.2.1 Wadarta Xaglo Guddeedyada Saddexagal

Fasalada hoose waxaad ku soo baratay noocyada kala duwan ee saddexagalada xaglo-gudeed tantaaliga ah iyo cabbirka xagasha toosan.

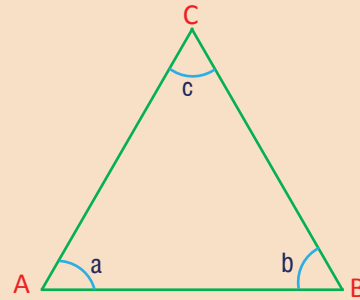
Shaqa Kooxeedka 5.2

Ka shaqee kuwa soo socda, adiga oo kadoodaya fekradaada ahaan kooxdiina dhexdeeda,

Qalabyada loo baahan yahay:- maqas, mastarad, warqad adag dhuuban

b ku dul sawir saddexagalka aad doonto warqad adag oo dhuuban

t U hadhee sidii lagu tusay, kolkaa ka goo ama ka jeex saddexda gees sidii lagu waaniyey qaybta hadhaysan.

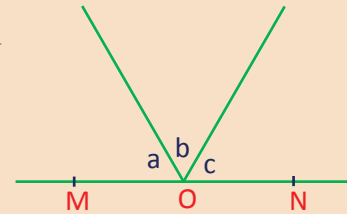


Jaantuska 5.15

j isku aadi saddexdaa qurub si wada jir ah cidhif-yadooda oo ku aadi girgirka (geerka) mastaradaad (ama geerka miiskaaga) sida lagu tusay

x waa imisa wadarta xaglaha a,b,c,?

kh waa imisa cabbirka xagal toosan ?



Jaantuska 5.15

d maxaad ku soo gabagabayn wadarta xaglo-gudeedka saddexagalka aad kor ku soo aragtay?

Hawlgal 5.7

- Siin saddex xariiqood l_1, l_2, l_3 ee salax halka l_1 ay barbaro la tahay l_2 islamarkaana l_2 iyo l_3 waa xariiqo isgooya, kadood xaglo-gudeedyada talantaaliga ah, imisa ayey dhan yihiin ? miyey isku sargo'an yihiin?
- Siin barta "P" iyo xariiqo " l " salax dushii halka P kuma dul dhacdo l , imisa xariiq ayaad ku dul sawir kartaa oo ka gudba "P" oo barbaro la ah L?

Aragtiin 5.1: (Aragtiinka wadarta xaglaha)

Wadarta cabbirka xaglo-gudeedyada saddexagal waa 180° .

Siin: $\triangle ABC$ ee leh xaglo-gudeedyada a , b iyo c .

Weydiin: caddee in, $a + b + c = 180^\circ$

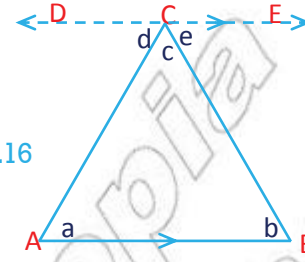
Sawir xariiqda \overline{DE} ee ka gudubta c , lana barbarro ah

\overline{AB} islamarkaa samaysa $\angle DCA$ iyo $\angle ECB$. Sida **jaantus 5.16**

u ku tusayo. Halka $m(\angle A) = a$, $m(\angle B) = b$,

$m(\angle C) = c$, $m(\angle ECB) = e$ islamarkaa $m(\angle DCA) = d$.

Caddeyn;



Jaantuska 5.16

Hawraar	Sababaha
1. $d + c + e = 180^\circ$	1. Xagal toosan
2. $d = a$	2. Xaglo gudeedyo talantaali ah.
3. $e = b$	3. Xaglo gudeedyo talantaali ah.
4. $e + d + c = 180^\circ$	4. Ka goynta talaabooyinka 2 iyo 3 tallaabada 1.
5. $a + b + c = 180^\circ$	5. Astaanta kala hormarinta isu geynta.

Sidaas awgeed, $m(\angle A) + m(\angle B) + m(\angle C) = 180^\circ$

Tusaale 1: Haddii cabbiraadda xaglaha saddexagal ay yihiin x° , $3(x^\circ)$ kolkaa cabirka xagal kastaa waa imisa?

Furfuris: Aragtiinka wadarta xaglaha

$$x^\circ + 3(x^\circ) + 5(x^\circ) = 180^\circ$$

$$9(x^\circ) = 180^\circ$$

$$x^\circ = 20^\circ, 3(x^\circ) = 60^\circ \text{ fi } 5(x^\circ) = 100^\circ.$$

Cabbirka xagal kastaa waa 20,60 iyo 100° sida ay isugu xigaan

Tusaale 2: Xaglaha saddexagal waa saami ahaan 1:3:6 raadi cabbirka xagal walba ee saddexagalka.

Furfuris: Ka soo qaado xaglaha saddexagalka, inay yihiin x , $3x$ iyo $6x$ sida ay isugu xigaan kolkaa

$$x + 3x + 6x = 180^\circ$$

$$10x = 180^\circ$$

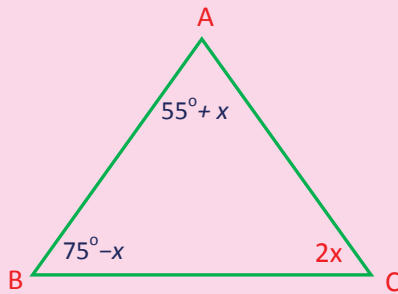
$$x = 18^\circ, 3x = 3(18^\circ) = 54^\circ \text{ islamarkaana}$$

$$6x = 6(18^\circ) = 108^\circ$$

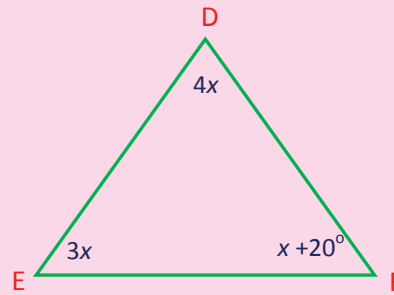
Laylis 5.6

- 1 Raadi cabbirka xagal kasta ee saddexagalka kolka xagal tahay 75° islamarkaa xagasha labaad waa afar-laabka cabbirka xagasha saddexaad?
- 2 Haddii cabbiraadda xaglaha saddexagl ay yihiin $2x^\circ$, $3x^\circ$, iyo $4x^\circ$, kolkaa waa imisa cabbirka xagal walba?
- 3 Saddexda xaglood ee saddexagal waa 4:5:9 saami ahaan, waa noocee saddexagalkani?
- 4 Raadi qiimaha x ee saddexagalada soo socda.

b



t



Jaantuska 5.17

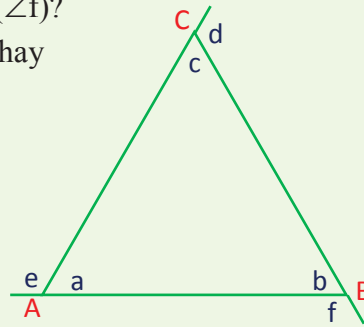
- 5 Saddexagal cabbiraada xaglihiisu ay yihiin x, y iyo z , raadi qiimaha x, y iyo z haddii $x + y = 110^\circ$ islamarkaa $x + z = 120^\circ$
- 6 Saddexagalka qumman ee hal xagal fiiqan ay la mid tahay afar lagu dhuftay cabbirka xagasha kale, raadi cabbirka xagal walba ee saddexagalka.
- 7 Cabbirka xagal raaran ee saddexagal labaaale ah wuxuu dheer yahay cabbirka xaglaha salka mid walba 30° , raadi cabbirka xagal kasta ee saddexagalka.
- 8 Cabbiraadda xaglaha saddexagalka ABC waxay u taagan yihiin $2x$, $x + 10$ iyo $2x - 30$.
 - b U qor wadarta cabbiraadda xaglaha X ahaan
 - t Raadi qiimaha x .
 - j Waa noocma saddexagalkani?

5.2.2 Xagal-Dibadeedka Saddexagal

Falanqaynteenii hore waxaad ku soo aragtay xaglogudeedyada iyo aragtiinka wadarta xaglaha gudaha ee saddexagal. Hadda, waxaad arki doontaa xagal kale oo xagal buuxisa xagal gudeed geese kastoo saddexagal laga yidhaa xagal-dibadeedka saddexagal.

Hawlgal 5.8

- 1 Ka jawaab mid walba su'aalaha soo socda adiga oo tixraacaya saddexagalka lagu siiyey ee jaantuska 5.18.
 - b** waa kuwee xaglo-gudeedyada $\triangle ABC$?
 - t** xagashee ayaad u malaynaysaa in ay tahay xaglo-dibadeedka $\triangle ABC$?
 - j** waa inimsa wadarta xaglo-gudeedku iyo xaglo dibadeedku ee $\triangle ABC$ gees kasta?
 - x** imisa xaglo-dibadeed ayaad ka filaysaa gees kastoo $\triangle ABC$?
 - kh** waa imisa wadarta $m(\angle d) + m(\angle e) + m(\angle f)$?
- 2 Ku qor run haddii hawraarta lagu siiyey sax tahay ama been haddii ay tahay qalad.
 - b** $m(\angle a) + m(\angle c) = m(\angle f)$
 - t** $m(\angle a) + m(\angle b) = m(\angle d)$
 - j** $m(\angle b) + m(\angle c) = m(\angle e)$
 - x** $m(\angle c) + m(\angle c) + m(\angle b) = m(\angle d)$
- 3 Sidee ayeynu uga muujin karnaa xaglo-dibadeed
 - b** saddexagalka
 - t** geesoole kasta



Jaantuska 5.18

Ogow:

- 1 Haddii dhinaca saddexagalka la fidiyo gees kasta, xagasha ka samaysanta dhinac deriska la ah waxaa lagu magacaabaa xaglo-dibadeedka saddexagalka.
- 2 Xaglo-dibadeedka geesoole kasta wuxuu u samaysmaa sida xaglo-gudeedka saddexagalka oo kale.
- 3 Gees kasta geesoolaha, waa xaglo isbuuxsha.
- 4 Gees kasta geesoolaha, waxaa jira laba xaglo-dibadeed kuwaas oo foodsaar isku ah.

Aragtiin 5.2: xagal dibadeedka saddexagal waxay le'eg tahay wadarta xaglaha gudaha ka durugsan.

Ogow: $\triangle ABC$ ee u ku tusayo jaantuske 5.20 dhexdiisa.

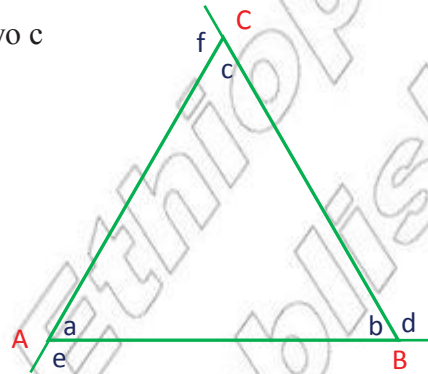
- ◆ Xaglaha A iyo C waxa la yidhaa xaglah gudeedyada ka durugsan xagal-dibadeeka $\angle d$.

- ◆ Xaglaha a iyo b waxa la yidhaa xaglo gudeedyada ka durugsan xagal dibadeedka $\angle f$.
- ◆ Xaglaha b iyo c waa xagla gudeedyada ka durugsan xagal dibadeedka $\angle e$.

Siin: $\triangle ABC$ oo leh xaglo gudeedyada a, b iyo c

Iyo xagal dibadeed ka d.

Waydiin: Caddee in $\angle d = \angle a + \angle c$



Jaantuska 5.20

Cadayn:

Hawraaraha	Sababaha
1. $a + b + c = 180^\circ$	1. Aragtiinka wadarta xaglaha
2. $b + d = 180^\circ$	2. Xagal toosan
3. $a + b + c = b + d$	3. Ka timid 1 iyo 2
4. $a + c = d$	4. b way wadaagaan 3
5. $d = a + c$	5. Dib u habayn

Sababla mid ah, waxaad eegi kartaa $e = b + c$ iyo $f = a + b$

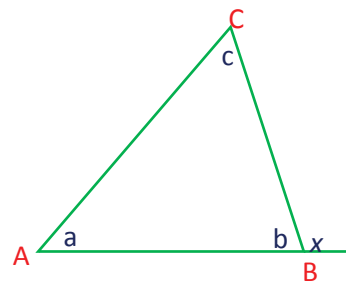
Tusaale 1: Haddii $x = 120^\circ$ islamarkaana $c = 70^\circ$, kadib raadi qiimaha a,

Furfuris: adeegsiga aragtiinka xaglo-dibadeedka

$$a + c = x$$

sidoo kale $a + 70^\circ = 120^\circ$, sidaas darteed

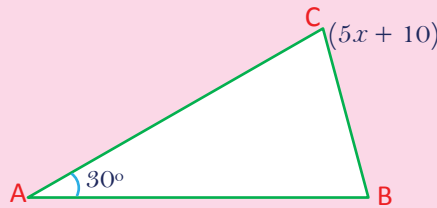
$$a = 120^\circ - 70^\circ = 50^\circ$$



Jaantuska 5.21

Laylis 5.7

- 1 Halka $\triangle ABC$, $\overline{AC} \equiv \overline{BC}$. Cabbirka xaglo-dibadeedka geeska C waxay u taagan tahay $5x + 10^\circ$, hadii $\angle A$ cabbirkeedu yahay 30° , raadi qiimaha x ,



Jaan 5.22

- 2 $\triangle ABC$, $m(\angle B)$ waa afar Laabka waynaanta sida $m(\angle A)$. Xagal-dibadeedka C cabbirkeedu waa 125° . Raadi cabbirka $\angle A$.
- 3 $\triangle DEF$, $m(\angle D) = 2x + 4$, $m(\angle E) = 6x - 58$ cabbirka xagal-dibadeedka F waxa uu u taagan yahay $5x$,
- b** raadi qiimaha x **t** waa maxay nooca saddexagalkani?
- 4 $\triangle ABC$, haddii $m(\angle A) = 35^\circ$ islamarkaa cabbirka xagal-dibadeedka C waa 105° , kadib waa imisa cabbirka $\angle B$?
- 5 Raadi cabbirka xagla-dibadeedka ka samaysma fidinta xaglaha salka saddexagalka labaale ah, haddii xagasha raaran saddexagalka cabbirkeedu yahay.
- b** 20° **t** 80° **j** 120° **x** 135°
- 6 Raadi cabbirka xagasha raaran ee saddexagalka labaale ah haddii xaglo-dibadeedka midkood ka samaysmo fidinta cabbirka salka.
- b** 100° **t** 140° **j** 160° **x** 135°

5.2.3 Wadarta Xaglo-Gudeedyada Geesoole

Waxaad ogaatay in ay jirto xidhiidh ka dhexeeya wadarta cabbirada xaglo gudeedyada geesoole iyo tirada saddexagalada ay ku sameeyaan xaglagooyeyaasha gees maguuraan ah.

Hawlgal 5.9

- 1 Sawir afargeesoolaha ABCD ka dooro hal gees. Geeskaas ka sawir xaglo-gooye kasta oo suurogalaya.
- b** imisa xaglo-gooyeyaal ayaad sawirtay adiga oo adeegsanaya hal gees?

- t** imisa saddexagal ayaa ka sameysmi kara ?
- j** waa imisa wadarta cabbirka xaglo-gudeedyada ee afar geeslooluhu?
- 2** Sawir shangeeslaha ABCDE. ku sawir xaglo-gooyeyaasha hal gees.
- b** imisa xaglo-gooyeayaal ayaad sawirtay?
- t** imisa saddexagal ayaa ka sameysmi kara?
- j** maxaad u malayn wadarta cabbirka xaglo-gudeedyada shan geesooleha?
- 3** Sawir lix geesooleha ABCDEF, ku sawir xaglo-gooyeyaasha halgees.
- b** imisa xaglo-gooyeayaal ayaad sawir tay ?
- t** imisa saddexagal ayaad heli kartaa?
- j** maxaad u malayn wadarta xaglo-gudeedka lix geesoolaha?

Hawlgalka sare, geesooleha tuurta leh ee leh n –dhinac waxaad ku soo koobi kartaa sida soo socota

Tirada dhinacyada	Xaglo-gooyeyaasha gees kasta	Tirada saddexagalada	Wadarta xaglo-gudeedyada
4	1	2	$2 \times 180^\circ = 360^\circ$
5	2	3	$3 \times 180^\circ = 540^\circ$
6	3	4	$4 \times 180^\circ = 720^\circ$
7	4	5	$5 \times 180^\circ = 900^\circ$
·	·	·	·
·	·	·	·
·	·	·	·
10	7	8	$8 \times 180^\circ = 1440^\circ$
·	·	·	·
·	·	·	·
n	$n - 3$	$n - 2$	$(n - 2) 180^\circ$

Aragtiin 5.3: wadarta cabbirada xaglo-gudeedyada geesoole tuurle kastoo n dhinac leh waxa lagu helaa $(n - 2)180^\circ$.

Tusaale 1: Raadi wadarta cabbirka xaglo-gudeedka geesoole leh 12-dhinac.

Furfuris: wadarta xaglo-gudeedyada geesooluhu = $(n - 2)180^\circ$
 $= (12 - 2)180^\circ$
 $= (10)(180^\circ) = 1800^\circ$

Tusaale 2: Raadi tirada dhinacyada geesoolaha haddii wadarta xaglo-gudeedkiisu yihiin 16200?

Furfuris: wadarta xaglo-gudeedku $= (n-2) \times 180^\circ$

$$1620^\circ = (n-2)180^\circ$$

$$1620^\circ = 180^\circ n - 360$$

$$1980^\circ = 180^\circ n$$

Sidaas darted, $\frac{1980^\circ}{180^\circ} = n$

$$11 = n \text{ ama } n = 11.$$

Ogow: Sidaas awgeed mid walba xaglo gudeedyada geesoolaha qaabsan way isku sargo'an yihiin, kadib cabbirka xaglo-gudeed kasta ee geesoolaha qaabsan oo leh n-dhinac wuxuu la mid yahay $\frac{(n-2) \times 180^\circ}{n}$

Tusaale3: Raadi cabbirka xaglo-gudeed kasta ee lix geesoolaha qaabsan?

Furfuris: xaglo-gudeed kasta ee geesooluhu = $\frac{(n-2) \times 180^\circ}{n}$
 $= \frac{(6-2) \times 180^\circ}{6}$
 $= \frac{4 \times 180^\circ}{6} = 120^\circ$

Laylis 5.8

- 1 Raadi wadarta cabbirka xaglo-gudeedyada geesoolaha leh tirada dhinayada soo socota.

b	8	t	12	j	15	x	20
----------	---	----------	----	----------	----	----------	----
- 2 Haddii wadarta cabbirka shanxaglo-gudeed ee lixgeesooluhu tahay 600° , raadi cabbirka xagasha lixaad.

- 3 Imisa dhinac ayuu leeyahay geesooluhu, haddii wadarta cabbirka xaglo-gudeedyadu tahay.
b 8 xaglo toosan **t** 3960° **j** 1800°
- 4 Raadi tirada dhinacyada ee geesoolaha qaabsan haddii xaglo-gudeed kasta uu yahay.
b 90° **t** 120° **j** 150° **x** 135°
- 5 Haddii xaglaha shan-geesooluhu ay yihiin x° , $2x^\circ$, $(x+30)^\circ$, $(x-10)^\circ$, $(x+40)^\circ$, raadi cabbirka xagal kasta?
- 6 Raadi wadarta tirada xaglo-gooyeyaasha laga sawiray hal gees ee geesoolayaasha soo socda ee leh dhinacyada lagu siiyey.
b 3 **t** 10 **j** 100 **x** n
- 7 Raadi xaglo-gudeed kasta ee afargeesooleha, haddii xaglo-gudeedyadiisu ay u taagan yihiin $x-5$, $x+20$, $2x-45$ iyo $2x-30$.
- 8 Xaglaha afargeesoolaha waa 1:6:7:4 saami ahaan, raadi cabbirka xagal kasta ee afar-geesooleha.
- 9 Miyey noqon kartaa wadarta cabbirka xaglo-gudeedyada geesoole 1350° ?
- 10 Laba xaglood ee shan-geesoole waa 100° iyo 150° , raadi saddexda xaglood ee kale, haddii ay isku sargo'an yihiin.

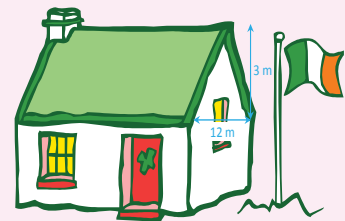
5.3 CABBIRAADDA

Qaybtani waa qeybta labaad ee joomatariga muhiimka in oo ah. Halkaas oo aanu ku eegi doono qaar ka mid ah fikradaha horey inoo la soo darsay. Waxaynu kaloon bilaabaynaa inaan ku dhisno qaababka badan ee aljebra si aynu u raadin wareegyada, bedadka iyo mugagga.

5.3.1 Bedka saddexagalka

Waxay ku bilaabmaysaan masaladan

Axmed wuxuu rabaa in uu ku bedalo dhinaca kore ee gidaarka ee leh qaabka saddexagal iskuulkiisa, waa imisa Bedka qeybta uu axmed rabo in uu bedalo?

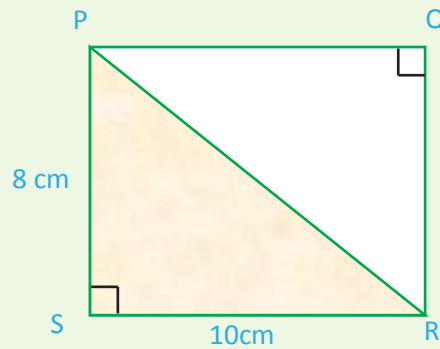


Jaantuska 5.23

Fasalkii 6^{aad} waxaad ku soo aragteen sida loo raadiyo bedadka laydiga iyo saddexalka-xagal quman. Hawlgalka soo socda wuxuu kaa caawinayaa sidii aad u jidmarin lahayd jidka guud si aad ugu raadiso bedka nooc walboo sadexagal ah.

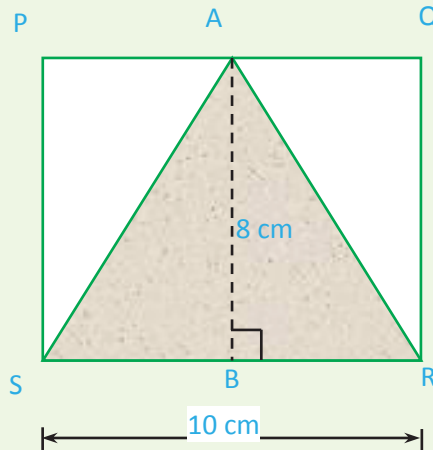
Hawlgal 5.10

- 1 Laydiga PQRS wuxuu u qeybsamaa laba saddexagal xagal qumman.
 - b sidee ayaad isu barbardhigi kartaa bedadka labadaas saddexagal?
 - t waa imisa bedka saddexagalka hadhaysan ?
 - j ma sheegi kartaa jidka guud ama habka loo raadiyo bedka saddexagal xagal quman?



Jaantuska 5.24

- 2 Laydiga PQRS ee loo qaybiyey afar saddexagal sida hoos ku xusan, A iyo B waa bar-badhayaasha PQ iyo SR, sida ay isugu xigaan.



Jaantuska 5.25

- b isbarbardhig bedadka $\triangle APS$ iyo $\triangle ABS$, maxay noqonayaan iyaguna bedadka $\triangle ABQ$ iyo $\triangle AQR$?

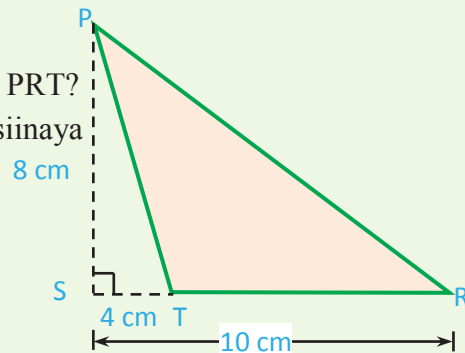
- t** jajab ahaan badka laydigu imisa ayuu ka noqonayaa bedka sadexagalka hadhaysan?
- j** maxaad ku soo koobi kartaa dhererka PS iyo AB?
- x** waa imisa bedka laydiga PQRS?
- kh** waa imisa bedka saddexagalka hadhaysan?
- d** ma siin kartaa jid guud habka loo raadiyo bedka saddexagal?

3 U fiirso ΔPRS .

b adiga oo adeegsanaya jidka aad heshay ee su'aasha tirada 1. Raadi bedka PRS iyo PTS?

t ka dib imisa ayuu noqonayaa bedka PRT?

j miyaad u heli jid bedka PRT ee ku siinaya cabbiraadda salka TR iyo joog qotonka ee lagu siiyey?



Jaantuska 5. 26

4 Adigoo tixgalinaya dhamaan xaaladaha aad horey u soo fiirisay ma sheegi kartaa jidka guud ee raadinta bedka saddexagal nooc kasta ah?

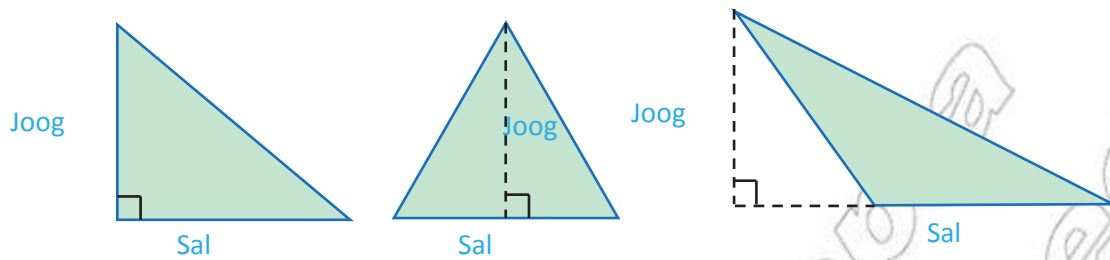
Jidka Bedka Saddexagal

Badka (A) ee saddexagalku wuxuu le'eg yahay taranta badhka salkiisa (b) iyo

jooggiisa (h) taas oo ah $A = \frac{1}{2} bh$

Ogow dhinaca saddexagal kasta, waxaa loo qaadan karaa sal islamarkaana fogaanta qotonku waa jooga xagal qumman ee dhinacaas. Haddaba, saddexagal kastaa wuxu leeyahay saddex sal iyo saddex joog oo ku aaddan.

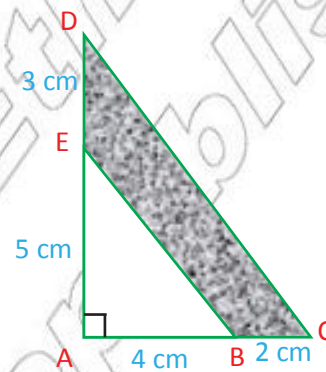
Xaaladda saddexagalka xagal furan leh, xariijinta loo isticmaalo joogga waxay ku dhici kartaa saddexagalka meel dibada ka ah sida shaxanka saddexaad u ku tusayo.



Jaantuska 5. 27

Tusaale1: Waa imisa bedka qeybta saddexagalka dugsiga ee jaale dayr rabo inuu ka bedalo taas oo lagu sheegey bilowgii masalada.

Furfuris: $A = \frac{1}{2}bh = \frac{1}{2} \times 12\text{m} \times 3\text{m}$
 $= 18\text{ m}^2$



Jaantuska 5. 28

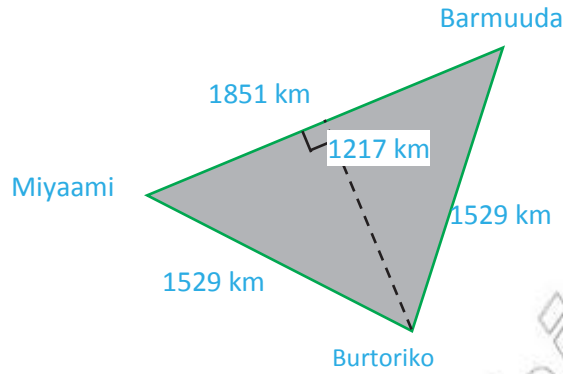
Tusaale2: Raadi bedka hadheysan

Furfuris: Bedka hadheysan = bedka $\triangle ACD$ – bedka $\triangle ABE$

$$= \frac{1}{2} \times 6\text{cm} \times 8\text{cm} - \frac{1}{2} \times 4\text{ cm} \times 5\text{ cm}$$

$$= 24\text{cm}^2 - 10\text{cm}^2 = 14\text{cm}^2$$

Tusaale 3: Saddexagalka barmuuda wuxuu ka samaysmaa xariijimo maangal ah oo ka bilawda bar u dhaw magaalada miyaami, ilaa barmuuda, ilaa purtoriko islamarkaana ku noqda miyaami. Waa imisa bedkaa oo dhan saddexagalka barmuuda.



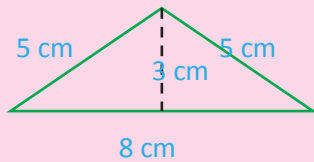
Jaantuska 5.29

Furfuris: $A = \frac{1}{2}bh = \frac{1}{2} \times 1851 \text{ km} \times 1217 \text{ km}$
 $= 1,126,333.5 \text{ km}^2$.

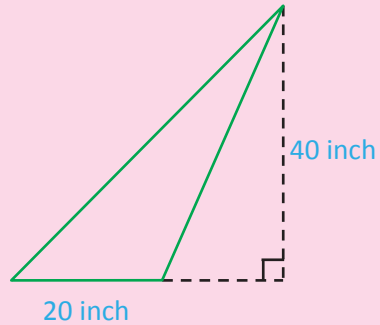
Laylis 5.9

1 Raadi bedka mid walba ama saddexagalka hoose ee lagu siiyey.

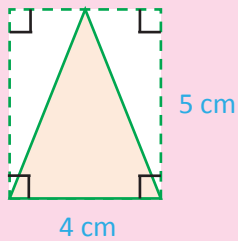
b



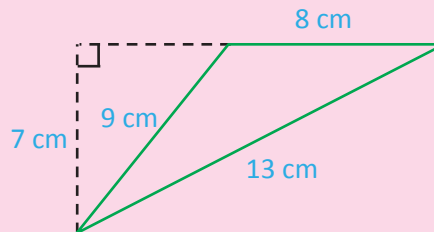
t



j



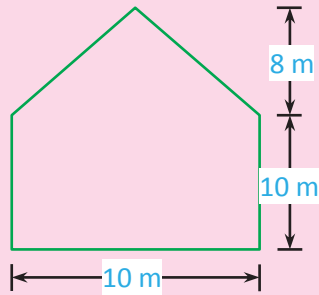
x



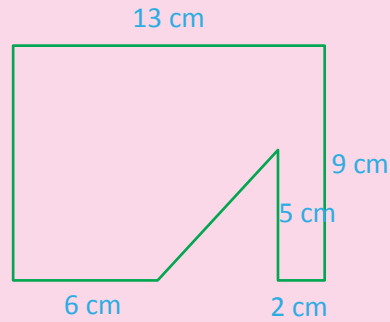
Jaantuska 5.30

- 2 Saddexagal leh bed 40 cm^2 ah islamarkaana salku yahay 8 cm . Raadi jooga saddexagalka.
- 3 Saddexagal leh bedka 120 m^2 islamarkaana joog qotonku yahay 10 m . Xisaabi salkiisa
- 4 Soo saar bedka dhafan ee muuqaal kastoo soo sood.

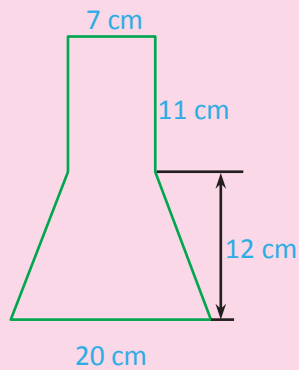
b



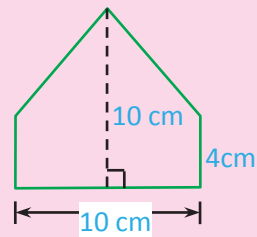
t



j

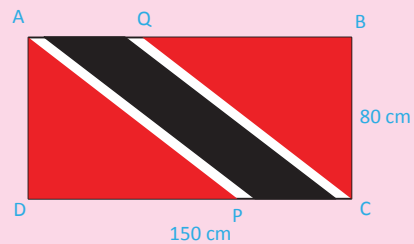


x



Jaantuska 5.31

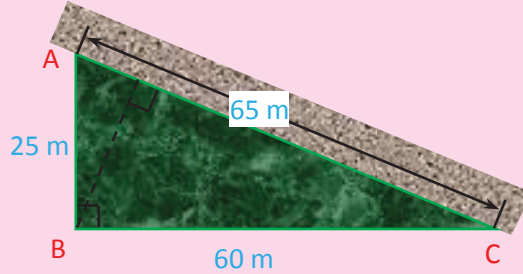
- 5 Calanka qaranka ee wadanku Tirindaad iyo Tobago wuxuu leeyahay saddex nashqadood. Cabbiraddoodu waa sida ku xusan jaantuska, haddii $BQ = DP = 100 \text{ cm}$



Jaantuska 5.32

- b xisaabi badka calanka
- t xisaabi badka cas ee calanka
- j Qiimaha marada calanku lagu sameeyaa waa Birr 64.00 m^2 – ba. Qiimo intee dhan ayey marada calanka si loo sameeyo noqonayaa?
- 6 ABC waa dhul qaab saddexagal leh sida cabbirada u ku tusayo jaantuska soo socda:
- b Raadi bedkeeda?

- t** Hilin ka bilaabma B ayaa u gudba ilaa meel aad ugu dhaw wadada. U adeegso bedka dhulka si aad u hesho dhererka hilinka ugu dhawaan mitir.



Jaantuska 5.33

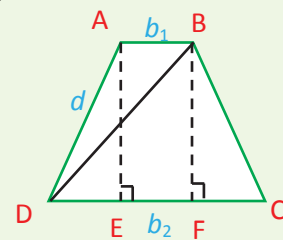
- 7** Saddexagal xagal quman oo leh dhererada 6cm,8cm, iyo 10 cm. Soo saar bedkiisa.

5.3.2 Wareega iyo bedka koorta

Qeybta 5.1.1 qeexaha, astaamaha koorta iyo sida loo dhiso koor ayaan ku soo qabanay koorta xakeeda. Hadda, waa ammintii la eegi sida loo raadiyo wareega iyo bedka koorta.

Hawlgal 5.11

- 1** Sawir koor leh baaxad kasta
- b** habee salalka, adimada iyo joogga koorta aad sawirtay
- t** cabbir dhamaan dhinacyadeeda
- j** soo saar wareegeeda.
- 2** u firso koorta ku muujisan dhinaca midig. Xagalagooyaha DB ay u kala qaybiya koorta laba saddexagal, $\triangle ABD$ iyo $\triangle BCD$.



Jaantuska 5.34

- b** muxuu noqon jooga $\triangle BDC$, u qaado dhinaca DC sal ahaan?
- t** waa sidee dhererka joogga $\triangle ABD$ (adiga oo u qaadanaya AB salka)?
- j** waa maxay sababta saddexagaladani ay u leeyihiin dherer jooga oo iskumid ah h?
- x** waa maxay jidka lagu raadiyo bedka $\triangle ABD$ iyo $\triangle BCD$?
- kh** miyaad dhiraandhirin kartaa jidka lagu raadiyo bedka koorta ABCD?

Wareegga

Wareegga geesoole waa wadarta dhererka dhinacyadiisa; .

Siin: koorta ABCD

Wareegga (p) koorta ABCD wadarta fogaanta ku wareegsan (kumeersan), Ta

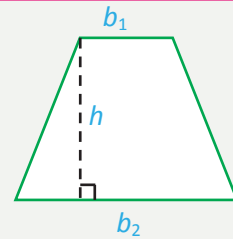
$$P = AB + BC + CD + DA$$

$$P = a + b + c + d$$

Jidka Bedka Koor:

bedka koortu waxay le'eg tahay wadarta dhererka dhinacyada barbarada ah oo lagu dhuftay fogaanta u dhaxaysa dhinacyadaas oo loo qeeybiyay labo,

$$A = \frac{1}{2}(b_1 + b_2)h$$

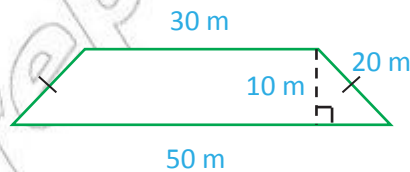


Jaantuska 5.35

Tusaale1: Raadi wareega iyo bedadka koorta labaale ah

Furfuris: $P = 30\text{m} + 20 + 50 + 20\text{m} = 120\text{m}$

$$\begin{aligned} A &= \frac{1}{2}(b_1 + b_2)h \\ &= \frac{1}{2}(30\text{ m} + 50\text{ m}) \times 20\text{ m} = 800\text{ m}^2 \end{aligned}$$



Jaantuska 5.36

Tusaale 2: Badka koor waa 110m^2 dhinacyada barbarada ah waa 13 cm iyo 7cm cabbirkoodu, raadi fogaanta u dhaxaysa dhinacyada barbarada ah,

Fur-furis: $A = \frac{1}{2}(b_1 + b_2)h$

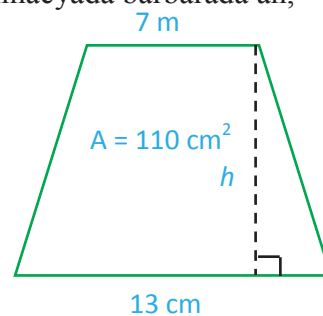
$$110\text{ cm}^2 = \frac{1}{2}(7\text{ cm} + 13\text{ cm})h$$

$$110\text{ cm}^2 = 10\text{ cm} \times h$$

$$11\text{ cm} = h$$

sidaas darted, fogaanta u dhaxaysa

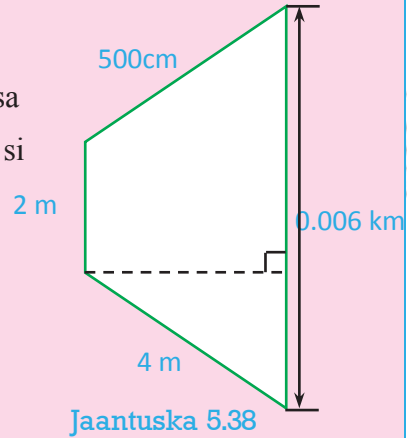
dhinacyada barbaraha waa 11cm



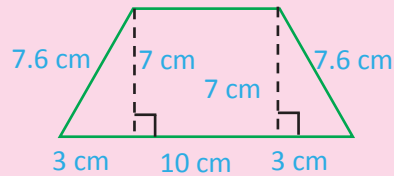
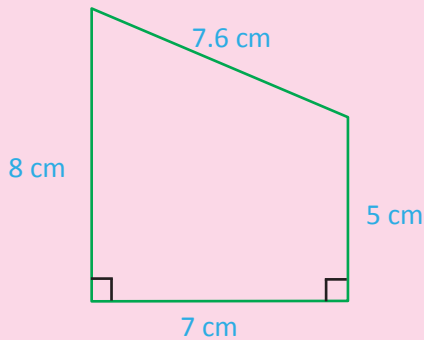
Jaantuska 5.37

Laylis 5.10

- 1 Xasan wuxuu haystaa dhul (sida ka muuqata dhinaca midig) kaas oo u baahan in loo oodo si looga ilaaliyo xayawaanka in uuna galin, imisa mitir oo xadhigwaayir ah ayuu u baahan yahay si uu u oodo oodo?



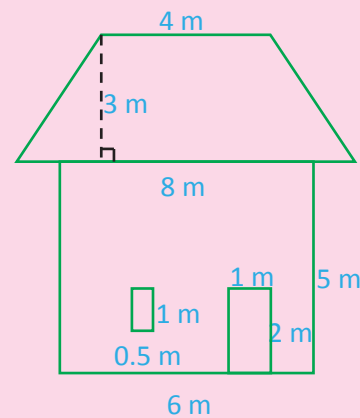
- 2 Raadi bedka koorta dhinacyadeeda barbaraha ahi ay yihiin 6cm iyo 11 cm, ee fogaanta u dhaxaysana ay tahay 8cm.
- 3 Xisaabi wareega iyo bedadka muuqaaladani.



Jaantuska 5.39

- 4 Bedka koorka ayaa ah 60cm^2 . Haddii joogiisu iyo mid kamid ah dhinacyada ay kala yihiin 6cm iyo 11cm sida ay isugu xigaan, raadi dhererka salka kale.
- 5 Faadumo waxay rabtaa in ay ranjiyeyso wajahada hore ee gurigooda.

- b** Raadi bedka u baahan in la ranjiyeeyo
- t** Faadurno waxay ka qaadataa Birr 3 cabbirka 1m^2 – kiiba ay ranjiyeysoba Imisa lacag ah ayey faadumo helaysaa?



Jaantuska 5.40

- 6 Khaddar wuxuu u baahan yahay in uu ogaado bedka iyo wareega dhul uu leeyahay oo ah qaab kooreed, aadimada 40 m iyo 50 m islamarkaana dhinacyada barbarada ah 90m iyo 12 m ay kala yihiin, joogiisuna yahay 40m. Xisaabi wareegga iyo bedka dhulka khaddar.

5.3.3 Wareegga Iyo Bedka Barbaroolaha

Ka hor inta aynaan u gudbin sida loo raadiyo wareega iyo badka barbaroolaha, aan nakhtiino astaanta barbaroolaha inaga oo adeegsanayna hawlgalka soo socda:-

Hawlgal 5.12

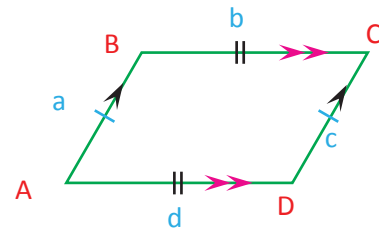
Sawir barbaroole baaxad kasta leh islamarkaana u dhig si siman geesihisa.

- b** dhinacee ayaa u ah sal?
t sidee ayaad u qeexi joogga barbaroolaha?
j ma sheegi kartaa jidka lagu raadiyo wareegga barbaroolaha?

Wareegga

Wareega barbaroolaha wuxuu ka kooban yahay is ugeynta dhamaan afartiisa dhinac ama waxaa kale oo ku siin kara labanlaabka wadarta labada dhinac ee aan barbarada ahayn, sabab?

$$\begin{aligned} P &= AB + BC + CD + DA \\ &= a + b + c + d \\ &= a + b + a + b \text{ (sababta oo ah } c = a \text{ iyo } d = b) \\ &= 2a + 2b = 2(a + b) \end{aligned}$$

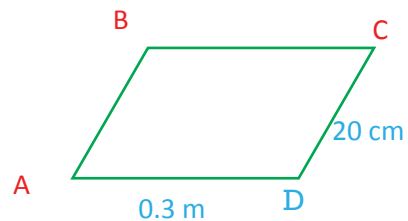


Jaantuska 5.41

Tusaale: Soo saar wareegga barbaroolaha hoos lagu siiyey

Fur-furis:

$$\begin{aligned} P &= 2(a + b) \\ &= 2(0.3\text{m} + 20\text{cm}) = 2(30\text{cm} + 20\text{cm}) \\ &= 2(50\text{cm}) = 100\text{cm} \end{aligned}$$



Jaantuska 5.42

Bedka**Shaqo Kooxeed 5.3****Shaqo laba-baba ah**

Kaabayaasha loo baahan yahay:-waraqaha xariiqaha leh, qalin qori iyo maqasyo.

Ujeeddo:-si loo dhiraandhiriyo jidka raadinta badka barbaroolaha

- 1 **Shaqo:**-shaxanka warqada dusheeda/warqada xariiqaha leh, sawir barbaroole leh baaxad kasta,
- 2 Goob barbaroolaha
- 3 Sawir xariiq u taagan joogga barbaroolaha islamarkaa hal dhinac goo adiga oo u eegaya jooga xariiqdiisa.
- 4 Isku habee qurubka aad goysey iyo ka kale ee ku yaal dhinac kale si ay u sameeyaan laydi. Waxaa laga doodi
 - i Isbarbardhig bedka laydiga samaysmay iyo bedkii hore ee barbaroolaha.
 - ii Barbaroolaha muxuu la mid yahay qeybta jooga ka laydiga.
 - iii Erayadaada ku sheeg jidka lagu helayo bedka barbaroolaha.

Jidka bedka barbaroolaha

Bedka barbarooluhu wuxuu le'eg yahay taranta salka (b) iyo joogga (h) taas oo ah $A=bh$

Tusaale 1: raadi bedka barbaroolaha PQRS iyo dhererka SR

Furfuris: bedka =bxh

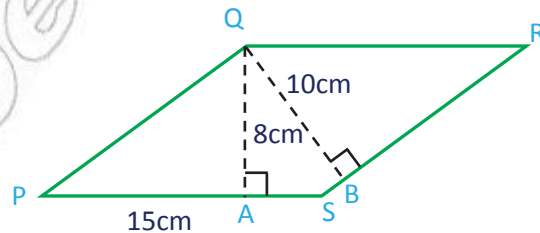
$$A=PS \times QA$$

$$A=15\text{cm} \times 8\text{cm} = 120\text{cm}^2$$

$$\text{Mar labaad bedka} = SR \times QB$$

$$120\text{cm}^2 = SR \times 10\text{cm}$$

$$12\text{cm} = SR$$



Jaantuska 5.43

Tusaale 2: Barbarroole leh badka 36cm^2 , haddii salka dhererkiisu yahay 4cm, raadi joogiisa.

Furfuris: $A = b \times h$

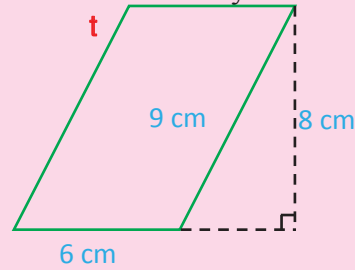
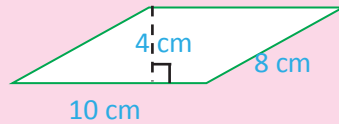
$$36\text{cm}^2 = 4\text{cm} \times h$$

$$9\text{cm} = h, \text{ sidaas dartee, joogu waa } 9\text{cm}.$$

Laylis 5.11

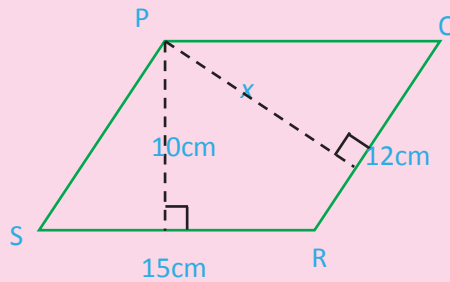
- 1 Soo saar wareegga iyo badka mid walba barbarrooleyaashan.

b



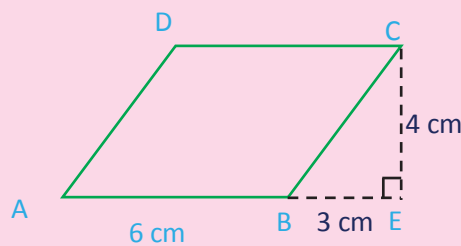
Jaantuska 5.44

- 2 Badka barbarroole waa 84cm^2 , haddii dhererka qotonkiisu yahay 21cm, soo saar salkiisa,
- 3 Badka lagu siiyey ee barbarroole waa 56cm^2 , haddii salkiisu yahay 8cm, raadi jooggiisu cm ahaan,
- 4 Soo saar dhererka dhinaca labadajibaar badkiisu le'eg yahay badka barbarroole leh salka 12 cm iyo joogga 3cm,
- 5 Barbaroolaha PQRS, raadi badka iyo qiimaha X,



Jaantuska 5.45

- 6 Shaxanka ABCD waa barbarroole raadi bedadka barbaroolaha ABCD iyo bedka afar-geesoolaha AECD.



Jaantuska 5.46

- 7 **b** haddii laba barbarroole ay leeyihiin wareeg isku mid ah, markaa miyey yeelan karaan bad isku mid ah?
- t** miyuu wareegga wayni markasta keeni bed wayn?
- j** muxuu noqon bedka barbarrooluhu haddii
- i** joogga la labolaabo?
- ii** salka iyo joogga labadoodaba la labalaabo?

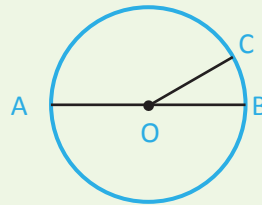
5.3.4 Meeriska Goobada

Qeybtan waxaydun raadinaysaan xidhiidhka ka dhaxeeya gacanka goobada iyo meeriskeeda. Tii oo ku salaysa natiijooyinkiina, waxaad soo saari doontaan jidka meeriska goobada ka dibna u adeegsataan si aad ugu furfurtaan maslooyinka la xidhiidha.

Hawlgal 5.13

1 U fiirso, goobada ku muujisan dhinac midig, sheeg tibaaxahan

b xudun **t** gacan
j dhexroor **x** meeris



Jaantuska 5.47

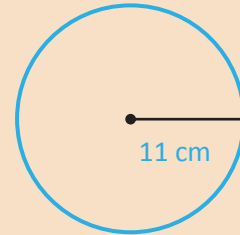
Shaqo Kooxeed 5.4

Qalabyada loo baahan yahay:-maqas, qalin qori.mastarad, qoobeeye waraaqda buugga

Ujeeddo:- In la soo sarro xidhiidhka ka dhaxeeya meeriska goobada iyo dhexroorka

Hawl:

- 1 Goobeeyaha ku sawir goobo gacankeedu yahay 11 cm
- 2 Goo goobada islamarkaana qalinka ku calaamadee meel ka mid ah meeriska goobada
- 3 Waraaqda buugga dushiisa ku samee qalinka calaamadi mid ka mid ah xariiqaha saar goobada xariiqda dusheeda adiga oo isku beegaya labada calaamadood ta goobada iyo xariiqdaah.
- 4 Ku dul wareeji goobada xariiqda dusheeda ilaa calaamada goobadu ay taabanayso xariiqda marlabaad, calaamadee barta xariiqda buuga.



Jaantuska 5.48

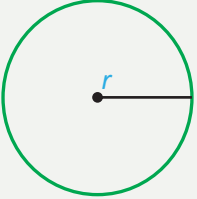


Jaantuska 5.49

Ka wada hadla /faahfaahiya

- b** waa imisa fogaanta u dhaxaysa labada calaamadood ee waraqada dusheeda?
 - t** waa imisa dhexroorka goobadu?
 - j** sidee ayaad dhexroorka goobada iyo fogaantan aad isubarbardhigi kartaa?
- 5** ku celi qaab lamid ah, addiga oo sawiraya goobo gacankeedu yahay 22cm, 33cm iyo 44cm
- 6** sidee ayaad dhexroorka goobada loola xidhiidhin karaa meeriska?

Shaqa –kooxeedka kor ku xusan ,waxaad ku soo koobi kartaa meeriska goobadu waxay si toosa ula xidhiidhaa dhexroorka. Meeriska goobadu waxay in yar dheer tahay saddex lagu dhuftey dhexroorka tirada lagu dhuftey waxaa lagu magacaabaa π { xaraf giriig ah- bay (pi) } badanaa ugu dhawaan π waa 3.14 iyo $\frac{22}{7}$.

Meeris	<p>Meeriska goobo wuxu la mid yahay π lagu dhuftey dhexroorka ama π lagu dhuftey labalaabka gacanka taas oo ah</p> <p>$C = \pi d$ ama $C = 2\pi r$</p> <p style="text-align: right; color: blue;">Jaantuska 5.50</p>	
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Tusaale1: raadi meeriska goobada gacankeedu yahay 5cm

Furfuris:

$$C = 2\pi r$$

$$= 2\pi \times 5 \text{ cm} = 10\pi \text{ cm} \approx 2 \times 3.14 \times 5 = 31.4 \text{ cm}$$

$$C \approx 31.4 \text{ cm}$$

Tusaale.2: dhexroorka taayir baaskiil waa 71 cm, fogaan intee le'eg ayaad socon doontaa kadib 10 wareeg u dhamaystiro taayirku.

Fur-furis: Sababtoo ah shaagu waa qaab-goobeed, kolkaa marka uu wareego hal wareeg u rogo, wuxuu socday in le'eg meeriska shaaga kolkaa:

$$C = \pi d$$

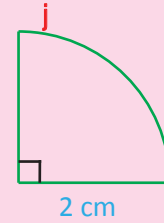
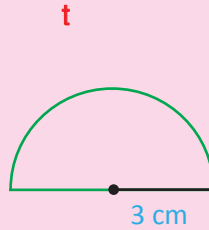
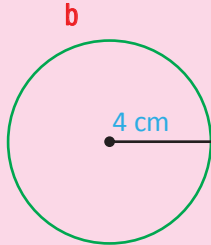
$$71 = 222.94 \text{ cm}$$

sidaas darted, wadarta fogaantu waxay noqonaysaa

$$10 \times 222.94 \text{ cm} = 2229.4 \text{ cm} \approx 22 \text{ m.}$$

Laylis 5.12

1 Raadi meeriska walxaha soo socda



Jaantuska 5.51

- 2 haddii meeriska goobo tahay 628cm, waa imisa gacanku?
- 3 Meeriska war qaab goobo ayaa ah 12.568 m. Soo saar dhexroorkeda.
- 4 Taayir leh dhexroorka 100cm, waa imisa fogaanta ay wareegeyso giraantiisu?
- 5 Sheeg sida meerisyada laba goobo la isu barbardhigo, haddii dhexroorka mid uu yahay labanlaabka cabbirka dhexroorka ka kale.

5.3.5 Bedka Goobo

Shaqo Kooxeed 5.5

Kaabayaasha loo baahan yahay: warqado, goobeeye, mastarad, qalin qori maqasyo.

Ujeeddo: in loo soo dhiraandhiriyo jidka lagu raadiyo bedka goobo

Hawsha: Sawir goobo intay doonto le'eg

- 1 U qeybi goobada 8 meelood oo isle'eg
- 2 Goo qayb walba goobada
- 3 Iskugu habee qeybaha sida saansaanta barbaroolaha



Janntuska 5.52

Ka hadala

- i** Muxuu noqon joogga “barbarooluhu”?
- ii** Muxuu noqon salka “barbarooluhu”?
- iii** Muxuu noqon jidka bedka ee barbarooluhu?
- iv** Sidee ayaad u adeegsan kartaa jidka lagu raadiyo bedka goobada?

Salka barbarooluhu wuxuu le’eg yahay badhka meeriska goobada $\left(\frac{1}{2}C\right)$

islamarkaana joogiisu wuxuu le’eg yahay gacanka goobada xogtan iyo jidka bedka barbaroolaha adiga oo adeegsanaya waad raadin kartaa bedka goobada

$$A = b \times h = \frac{1}{2}C \times r = \frac{1}{2} \times 2\pi r \times r = \pi r^2.$$

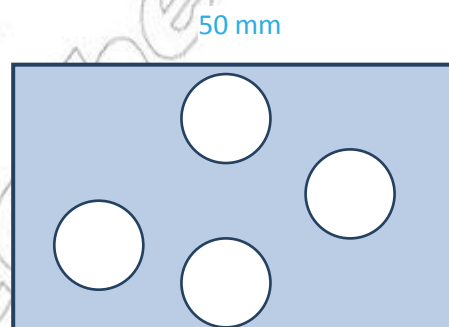
Bedka (A) goobadu wuxuu la mid yahay isku dhufashada π iyo labajibbaarka gacanka (r) taas oo ah $A = \pi r^2$



Tusaale 1: Raadi badka goobo dhexroor keedu yahay 20cm.

Furfuris: $A = \pi r^2 = \pi \times 10^2 \text{ cm}^2$ (maadaama $\frac{d}{2} = r$)
 $= 100\pi \text{ cm}^2 \approx 314 \text{ cm}^2$

Tusaale 2: Waslad Birr qaab laydi ah sida lagugu tusay jaantuska. Ayaa afar god oo leh dhexroor 10 cm ayaa laga dhex-saaray. Soo saar bedka birta soo hadhay.



Jaantuska 5.53

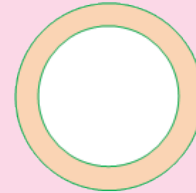
Furfuris: Badka birta soo hadhay = badka laydiga – bedadka gaabooyinka

$$= 50\text{mm} \times 30\text{mm} - 4(\pi \times 5^2\text{mm}^2)$$

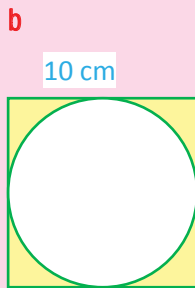
$$= 1500\text{mm}^2 - 100\pi \text{ mm}^2 = (1500 - 100\pi) \text{ mm}^2$$

Laylis 5.13

- 1 Raadi bedka goobada, haddii ay leedahay **b** gacan 40 cm ah **t** dhexroor 2π cm ah
- 2 Haddii bedka goobo yahay $64\pi\text{cm}^2$, muxuu noqonayaa dhexroorkedu?
- 3 Haddii meeriska goobo yahay 20π cm, muxuu noqonayaa bedkiisu?
- 4 Raadi bedka u dhaxeeua labada goobo isku dhaxmeeran oo ka kore leeyahay dhexroorka 8cm islamarkaana ka guduhu leeyahay dhexroorka 6cm.
- 5 Soo saar bedka qaybta hadhaysan, kasta



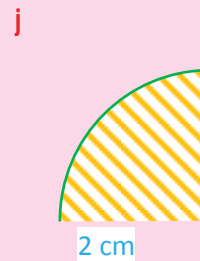
Jaantuska 5.54



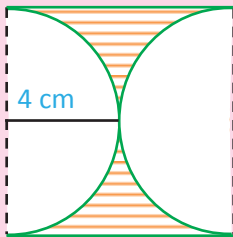
x



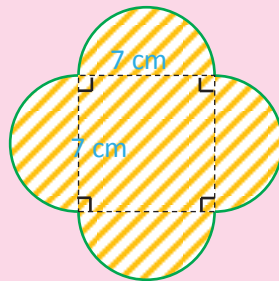
kh



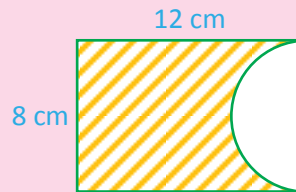
d



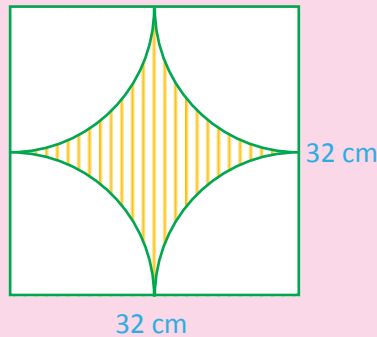
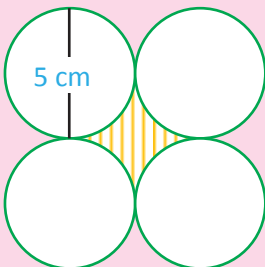
r



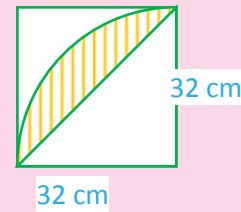
s



sh

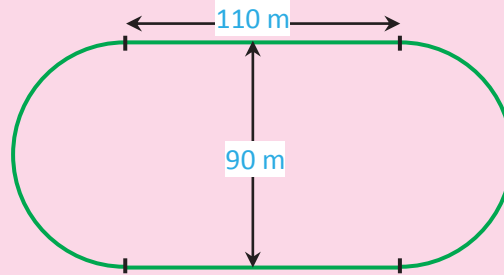


Jaantuska 5.55



s

- 6 Qaabka garoonka olombikada ayaa wuxu u ka samaysan yahay laydi iyo laba badh goobooyin, raadi wareega iyo bedkiisa?
- 7 dhexroorka giraanta kubadda kolayga ayaa ah 18cm, raadi meeriska giraanta iyo bedka ay ku wareegsan tahay?



Jaantuska 5.56

- 8 Haddii gacanka goobada laban laabmo, maxaa iska bedalaya badkeeda?
- 9 Gacanka saddex bissa yer, dhex iyo wayn ay kala yihiin 20 cm, 30 cm iyo 40 cm siday u kala horeeyaa au.
- b** soo saar
- t** midkee midkee ayaa u fiican in la iibsada kolka labada dooran sino isku qiimo yihiin.

5.3.6 Bed duleedka Biriisam iyo Dhululbo

Waxbarashadii hore dhexdeeda, waxaad ku baratay sida lagu helo bedduleedka iyo mugga biriisam qaab laydi ah. Waxa kaloo inaad iyana raacsan taqaano qeexaha iyo astaamaha ay leeyihin. Qaybtan waxaad ku barandoontaan habka guud ee lagu soo saaro bedduleedka biriisamka iyo dhululubada.

Hawlgal 5.14

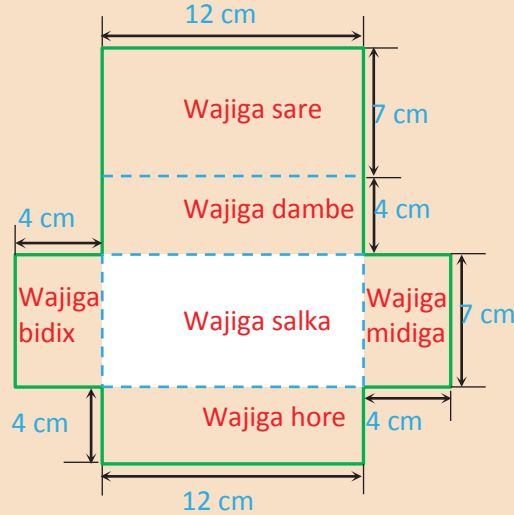
- 1 Qeex
b biriisam **t** biriisam qaab laydi ah
- 2 Sheeg qaar ka mid ah tusaalayaasha walaxha leh qaabka biriisam laydi?
- 3 Imisa waji ayuu leeyahay biriisam ka qaab laydi? Waana imisa tirada geesaha iyo geerarkiisa?
- 4 Sheeg (qeex) waa maxay macnaha sal, wajiga dadabta, bed duleedka dadabta iyo wadarta bed duleedka biriisam laydi ah.

Hadda aan ka shaqayno shaqo kooxeedka soo socda oo ina awoodsiinaya dhiraandhirinta jidka lagu raadiyo bed –duleedka biriisamka laydiyeed.

Shaqa Kooxeed 5.6

Qalabyada loo baahan yahay: shaxan/warqad xariiqo leh, qalin qori, maqasyo mastarad.

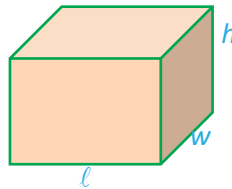
Hawsha



Jaantuska 5.57

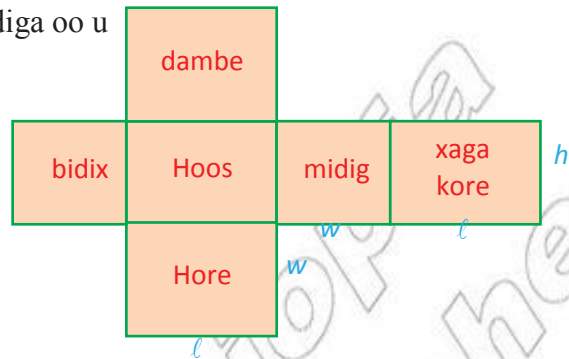
- 1 Shaqo) warqada dusheeda (warqada leh xariiqo, ku sawir si isku tax ah oo siman sida hoos lagu tusay.
- 2 Isku laab adiga raacaya xariiqaha dhibcaha leh sidaas u samayso shaxan saddex adinle ah, isku dhaji jirjirada.
- 3 Waa maxay magaca shaxanka adka ah ee aad isku habaysay?
- 4 Soo saar bedka dhinac kasta ee shaxanka?
- 5 Isbarbardhig badka.
 - i Wajiga kore iyo ka hoose
 - ii Wajiga hore iyo ka danbe
 - iii Wajiga bidix iyo ka midig
- 6 Waa imisa wadarta bad-duleedka shaxanka aad samaysay?

Guud ahaan biriisam laydi ah oo leh addimada ℓ , w iyo h ,



Jaantuska 5.58

Bed-duleedka waxaa lagu raadin karaa adiga oo u fiirsanaya salidiisa sida hoos lagu tusay.



Bedka wajiga hore = Bedka wajiga dambe = $\ell \times h$

Jaantuska 5.59

Bedka wajiga bidix = Bedka wajiga midig = $w \times h$

Bedka sare = Bedka hoose = $\ell \times w$

haddaba Maadaama bed-duleedka dadabta (A_L) waa wadarta bedka dhamaan wajiyada laga reebo salka sare iyo ka hoose.

A_L = Badka xaga hore + Badka xaga Danbe + Badka dhinac bidix + Badka dhinac midig

$$A_L = \ell h + \ell h + wh + wh$$

$$= 2\ell h + 2wh = 2(\ell h + wh) = 2h(\ell + w)$$

$$= h \times 2(\ell + w)$$

= $h \times p$, halka p tahay wareegga salka

$$A_L = ph$$

Markale, maadaama wadarta bed-duleedka (A_t) ee biriisam laydi ah yahay wadarta dhamaan bedadka wajiyada biriisamka.

$$A_t = A_L + \text{badka salka}$$

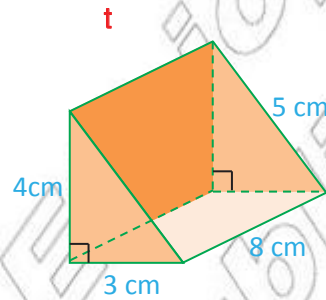
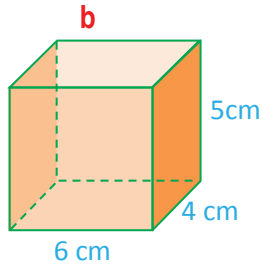
$$A_t = A_L + 2A_b = \text{badka salka}$$

$$A_t = 2A_{\text{xaga hore}} + 2A_{\text{bidix}} + 2A_{\text{xaga kore}} \text{ (sabab?)}$$

$$A_t = 2(\ell h + wh + lw)$$

Xusuusnow: Jidka aan kor ku soo gunaanadnay run kuma aha biriisam laydi ah oo kaliya, laakiin waxa kale oo uu run ku yahay dhamaan noocyada biriisamyada kala duwan.

Tusaale 1: Soo saar bad-duleedka dadabta iyo wadarta bad-duleedka ee biriisamyada soo socda



Jaantuska 5. 60

Furfuris:

b $A_L = p \times h = 2(6 + 4) \times 5$
 $= 2 \times 10 \times 5 = 100\text{cm}^2$ isbarbardhig

$$A_T = A_L + 2A_B$$

$$= 100\text{cm}^2 + 2 \times 6\text{cm} \times 4\text{cm}$$

$$= 100\text{cm}^2 + 48\text{cm}^2 = 148\text{cm}^2 \text{ ama}$$

$$A_T = 2lw + 2lh + 2wh$$

$$= (2 \times 6 \times 4 + 2 \times 6 \times 5 + 2 \times 4 \times 5)\text{cm}^2$$

$$= (48 + 60 + 40)\text{cm}^2 = 148\text{cm}^2$$

t Halkan, biriisam waxaa lagu magacaabaa biriisam laydi ah.

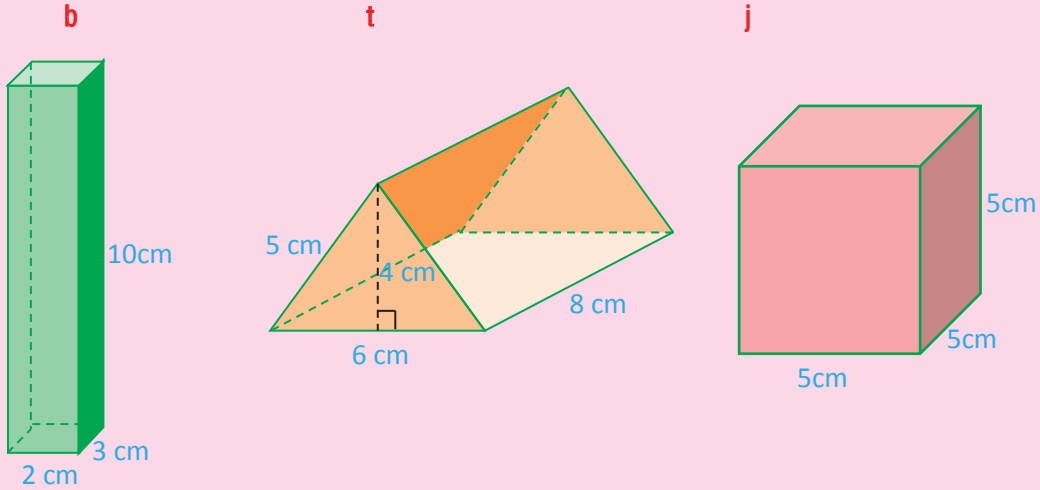
$$A_L = ph \quad \text{islamarkaana } A_T = A_L + 2A_B$$

$$= (4\text{cm} + 3\text{cm} + 5\text{cm}) \times 8\text{cm} \quad = 96\text{cm}^2 + 2 \times \frac{1}{2} \times 4\text{cm} \times 3\text{cm}$$

$$= 96\text{cm}^2 \quad = 96\text{cm}^2 + 12\text{cm}^2 = 108\text{cm}^2$$

Laylis 5.14

- 1 Soo saar bed-duleedka dadabta iyo wadarta bed-duleedka ee mid katsta birilsamyada soo socda?



Jaantuska 5.61

- 2 Waji kasta ee saddexjibbaarane ayaa leh bed ah 16cm^2 . Waa maxay bed-duleedka saddexjibbaaranuhu?
- 3 Wadarta bed-duleedka saddexjibbaarane ayaa ah 54cm^2 . Waa maxay bedka waji qudh ah? Waa maxay dhererka darafka (girgirka) saddexjibbaarane?
- 4 Waa maxay wadarta bed-duleedka saddexjibbaarane cabbirku addimadiisu ay yihiin 6 cm, 8 cm iyo 11 cm?
- 5 Qol leh dherer 4m, ballac 3 cm iyo joog qoton 2 m ah. Soo saar bed-duleedka gidaarrada?
- 6 Qol u cabbiran 4m iyo 7m, isla markaa joogga saqafku yahay 3m. Hal litir rinji ah ayaa la mariyaa 20m^2 . Imisa litir oo ranji ah ayey qaadan doonaan dhammaantood oo aanu ku jirin sagxada hoose ee qolka?

Dhululubo

Shaqa kooxeedka soo socda, waxaad dhisi doontiin dhululubo taas oo idinka caawinaysa si aad u dhiraandhirisaan jidka bed-duleedka dhululubada.

Shaqo Kooxeed 5.7

Qalabyada loo baahan yahay:

Goobeeye, qalin qori, maqasyo, mastarad, xabag iyo warqad garaaf (xariijimo leh)

Hawl:

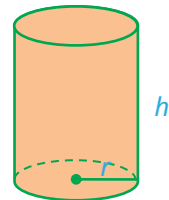
- 1 Wargadda garaafka dusheeda, ku sawir laba goobo oo mid kasta gacankeedu yahay 5 cm.
- 2 Ka soo goo goobooyinka.
- 3 Sawir laydi uu ballacu yahay 12 cm iyo dherer 33 cm isla markaa ka soo goo.
- 4 Laydiga u duub si salalka dhululubo u leekaadaan goobooyinku. Isku xabagee si dhinac xarriiqaha garaafka u muugdaan.

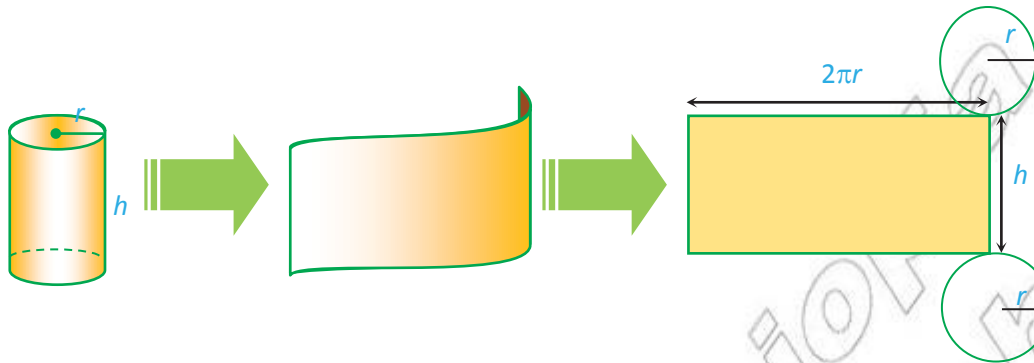
Dhugasho:

- 1 Waa maxay qaabka sal kasta ee dhululubadu?
- 2 Soo saar bedka sal kasta?
- 3 Hadda, soo saar bedka dusha xoodan. Ka hor inta aadan u duubin dhululubo ahaan, muxuu ahaa qaabkiisu?
- 4 Waa maxay wadarta bed-duleedka? Sidee ayaad ku soo saanraa?
- 5 Qor qaaciidada bed-duleedka dhululubo?

Guud ahaan waxaynu heli sida soo socota:-

- ◆ Dhinaca kore iyo dhinaca hoose ee dhululubadu waa goobooyin is baaxad le'eg laguna magacaabo salalka dhululbo.
- ◆ U firso qeybta soo hadhay ee dhululubada taas oo ah dusha xoodan, haddii aad ka gooyso (adiga oo aan isku laabayn) waxay ku siinaysaa laydi adimadiisu yihiin $2\pi r$ iyo h





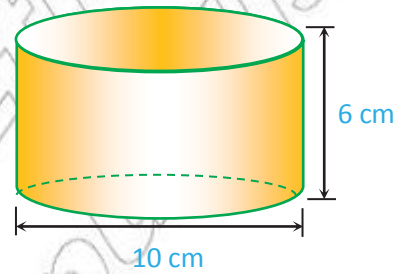
Jaantuska 5.62

Waa maxay sababta dhererku u le'eg yahay meeriska goobada?

Bed-duleedka dadabta (A_L) = bedka laydiga = $2\pi rh$

Bedka salka (A_B) = πr^2

Wadarta bed-duleedka (A_T) = $A_L + 2A_B$
 $= 2\pi rh + 2\pi r^2$
 $= 2\pi r (h + r)$



Jaantuska 5.63

Tusaale 1: Raadi A_B , A_L iyo A_T ee dhululubada

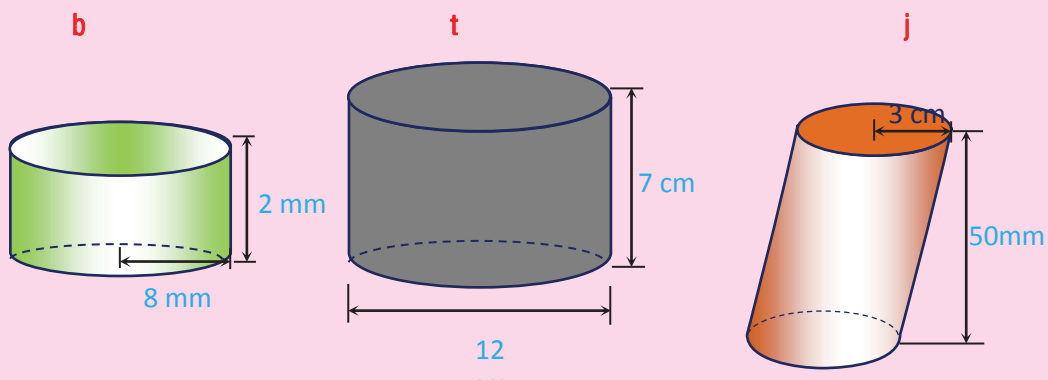
Fur-furis: $A_B = \pi r^2 = \pi \times 5\text{cm}^2 = 25\pi\text{cm}^2$

$A_L = 2\pi rh = 2\pi \times 5\text{cm} \times 6\text{cm} = 60\pi\text{cm}^2$

$A_T = A_L + 2A_B = 60\pi\text{cm}^2 + 2 \times 25\pi\text{cm}^2$
 $= (60\pi + 50\pi)\text{cm}^2 = 110\pi\text{cm}^2$

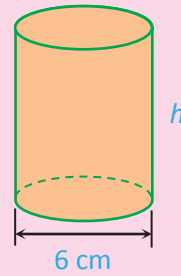
Laylis 5.15

1 Soo saar bed duleedka dadabta iyo wadarta bad-duleedka mid kasta dhululuboyinka soo socda.



Jaantuska 5. 64

- 2 Joogga daasad sharaab waa 11 cm, islamarkaa dhexroorkedu waa 18 cm raadi bed-duleedka daasada sharaabka.
- 3 Siin $A_T = 60\pi\text{cm}^2$. Soo saar qiimaha h .



Jaantuska 5.65

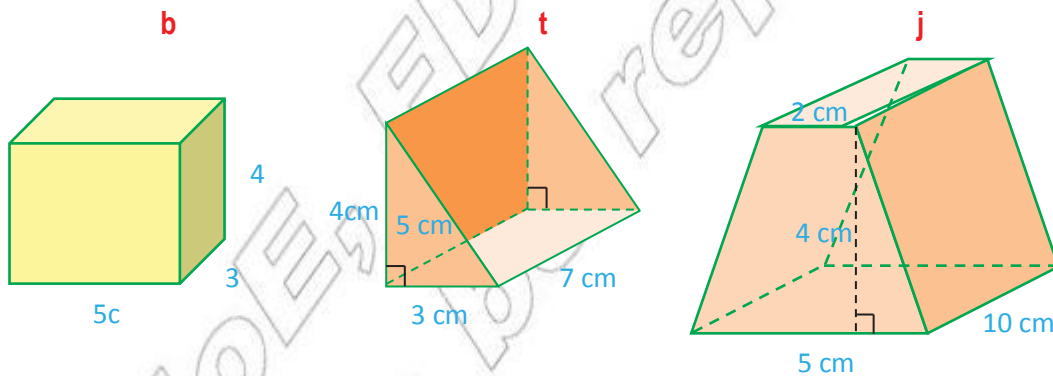
5.3.7 Mugga Biriisamka Iyo Dhululubada

Biriisamka

Fasalkii 6^{aad} waxaad ku soo aragteen qaabka loo raadiyo (saaro) mugga biriisam laydi ah, taas oo ah mugga (inta ay qaadato) biriisam laydi ah, (V) waxay le'eg tahay isku dhufashada bedka salka (A_B) iyo joogga (h):- $V = (\ell \times w) \times h$.

Ogow: jidka wuxuu u noqonayaa noocyada biriisam kasta $V = A_B \times h$

Tusaale 1: Soo saar mugga mid walba biriisamyada soo socda:



Jaantuska 5.66

Furfuris: b $V = A_B \times h$
 $= 5\text{cm} \times 3\text{cm} \times 4\text{cm} = 60\text{cm}^3$

t $V = A_B \times h$
 $= \frac{1}{2} \times 4\text{cm} \times 3\text{cm} \times 7\text{cm} = 42\text{cm}^3$

j $V = A_B \times h$
 $= \frac{1}{2} (2\text{cm} + 5\text{cm}) \times 4\text{cm} \times h\text{cm}$
 $= 14\text{cm}^2 \times 10\text{cm} = 140\text{cm}^3$

Dhululubo

Hawlgal 5.15

Isbarbardhig oo soo koob, “ biriisam iyo dhululubo” oo loo tixraacayo astaanta soo socota.

- b** Labadooduba ma qaab 3 dhinac laa?
- t** Waa maxay salka dhululubadu? Biriisamkuna?
- j** Imisa sal ayey dhululubadu leedahay? Biriisamkuna?
- x** Maxaad ka odhan kartaa salalkeedu ay dhululubada?
- kh** Labaduba miyey leeyihiin jeb-gudub madoorsoome ah?

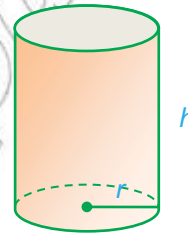
Hawl galka korka ku xusan waxaad ku soo gabagabaynaynaa sida soo socota guud ahaan “dhululubadu waa biriisam salkiisu yihiin goobooyin”

Mugga.

Waa maxay jidka lagu raadiyo mugga biriisam?

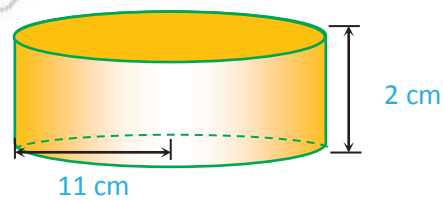
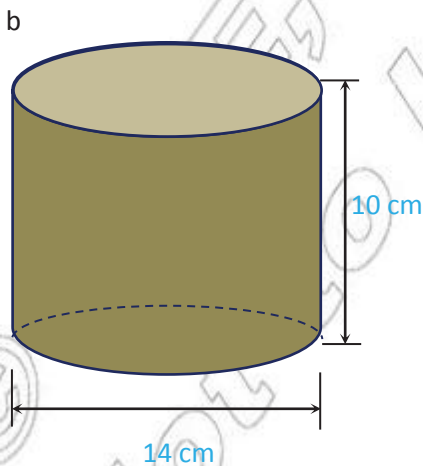
$$V_{\text{dhululubo}} = A_{\text{sal}} \times \text{jooq}$$

$$V = \pi r^2 h$$



Tusaale 1: Raadi mugga dhululubooyinka ku muujisan jaantusyada soo socda.

Jaantuska 5.67



Jaantuska 5.68

Furfuris:

b $V = \pi r^2 h$
 $= \pi \times (7\text{cm})^2 \times 10\text{cm}$
 $= 490 \pi \text{ cm}^3$

t $V = \pi r^2 h$
 $= \pi \cdot (11\text{cm})^2 \times 2\text{cm}$
 $= 242\pi \text{ cm}^3$

Tusaale 2: Daasadda digirta ayaa gacankeedu yahay 4 cm. Haddii mugeedu yahay $80\pi\text{cm}^3$, soo saar jooggeeda.

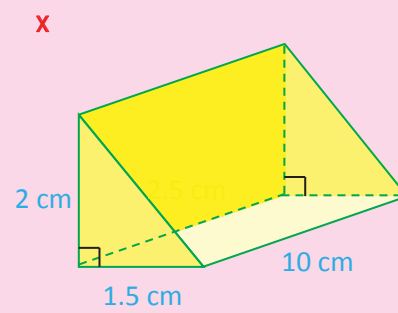
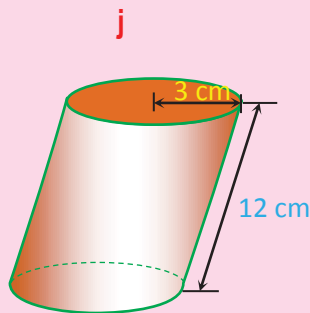
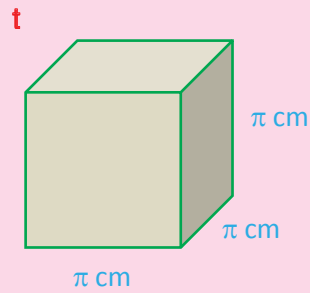
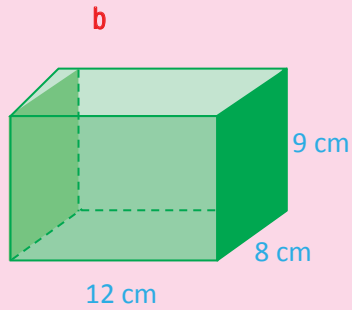
Furfuris: $V = \pi r^2 h$
 $80\pi\text{cm}^3 = \pi \times (4\text{cm})^2 \times h$
 $\frac{80\pi\text{cm}^3}{16\pi\text{cm}^2} = h$
 $5\text{cm} = h$ ama $h = 5\text{cm}$



Jaantuska 5.69

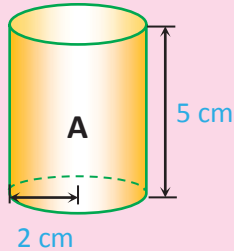
Laylis 5.16

1 Soo saar mugga iyo bed-duleedka walxaha adke ee soo socda.



Jaantuska 5.70

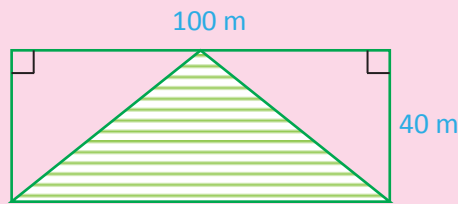
2 Shaxannada soo socda waxay tusayaan laba dhululubo, A iyo B



Jaantuska 5.71

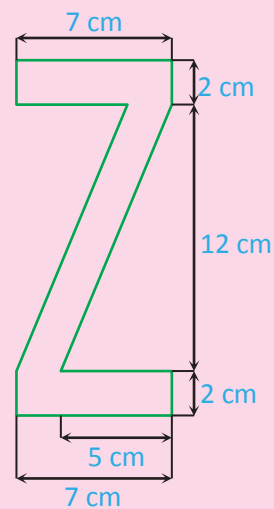
- b** Tus in ay labada dhululubo leeyihiin mug isku mid ah.
- t** Soo saar wadarta bed-duleedka dhululubo kasta.

- 3** Dhululubo leh mugga $120\pi\text{cm}^3$ islamrkaana gacanku yahay 8 cm
- b** Soo saar joogga dhululubada?
- t** Soo saar wadarta bed-duleedka dhululubo kasta.
- 4** Taangi biyood kaluun saddexjibbaarane ah yar ayaa qaada 24 litir oo biyo ah. Dhererku waa 40 cm islamarkaa balacuna waa 20 cm. Waa maxay joogga taangigu?
- 5** Muga birisam shan-geesoole ayaa ah 300cm^3 . Raadi bedka salkiisa, haddii cabbirka jooggu yahay 6cm.
- 6** Barkad lagu dabaasho oo leh 25m oo dherer ah, 15m oo balac ah islamarkana leh 3m oo qotin ah (gun), imisa litir oo biyo ah ayaa ku jira barkada?
- 7** Haddii aad labanlaabto joogaa dhululubada muxuu noqon isbadalka uu ku yeelanayo mugga? Faah-faahi?
- 8** Raadi bedka qeybta hadhaysan ee shaxanka hoos lagugu siiyey.



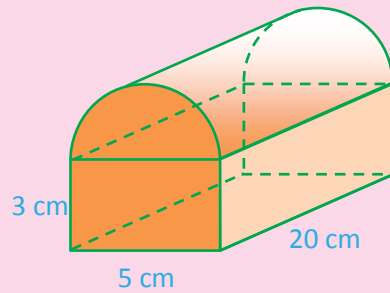
Jaantuska 5.72

- 9** Bedka koor ayaa ah 200cm^2 . Dhinacyadiisa barbarada ah waa 40 cm iyo 60cm. Waa imisa fagaanta u dhexaysa dhinacyada barbarada ah?
- 10** Shaxanka soo socda wuxuu ku tusayaa qeyb bir xadiid ah, soo saar bedkeeda?



Jaantuska 5.73

- 11 Bedka goobada lagu siiyey waa $121\pi\text{cm}^2$. Soo saar meeriska isla goobadaas.
- 12 Guri laydi ah ayaa leh 5m oo dherer ah, 3 m oo joog ah iyo 4 m oo balac ah, intee waraaqaha dhamaan gidaarkiisa lagu dhajinay, adiga oo aan eegayn albaabadiisa iyo daaqadihiida?
- 13 Raadi joogga dhululubada haddii bad-duleedka dadabta iyo gacanku ay yihiin $70\pi\text{cm}^2$ iyo 5 cm, siday u kala horeeyaan.
- 14 Mugga dhululubo goobeed quman waa $96\pi\text{cm}^3$, haddii dhexroorka salku yahay 8cm raadi jooggeeda.
- 15 Wadarta dhererka girgirada saddex jibaarane waa 84cm, waa imisa dhererka hal girgir? Raadi bed-duleedka iyo mugga.
- 16 Soo saar bed-duleedka dadabta iyo wadarta bed-duleedka shaxanka adkaha ah soo socda.



Jaantuska 5.74

➔ Erayada Muhiimka ah

➔ Afar geesoole	➔ Dhexdhexaad	➔ Qaanso
➔ Hilin fudud oodan	➔ Joog	➔ Sidkan
➔ Gees	➔ Barbarroole	➔ Isbuuxsha
➔ Dhinacyada deriska ah	➔ Laydi	➔ Fogaan siman
➔ Dhinacyo iska soo hor jeeda	➔ Qardhaas	➔ Xuddun
➔ Xaglo-qudeed	➔ Laba Jibbaarane	➔ Xagal toosan
➔ Xaglo-gooye	➔ Lammaane	➔ Xaglo-gudeed talantaali ah
➔ Geesoole	➔ Isku sargo'an	➔ Gudbe
➔ Geesoole tuur leh	➔ Isku Xiga	➔ Xagal gudeedyo durgsan
➔ Geesoole golxo leh	➔ Qeybshe	➔ Geesoole qaabsan
➔ Koor	➔ Gacan	➔ Salal (sal)
➔ Boqon	➔ Addimmo	➔ Dhexroor



Soo Koobida Cutubka

- 1 Afargeesle waa geesoole afar dhinacsi fudud ugu dooan sahlan oo xidhan
 - b Dhinacyada deriska ah ee afargeesoolahu waa dhinacyaa leh gees wadaag.
 - t Dhinacyada iska soo horjeeda ee afargeeslaha waa dhinacyada aan wadagin gees.
 - j xaglo-qudeedyada afargeesoole waa xaglaha ay sameeyaan dhinacyada deruska ah ee afargeesoolaha.
 - x xaglo-gooyaha afargeesoole waa xariijinta isku xidha labada gees ee aan isku xigin ee barbaroolaha
- 2 Koortu waa afargeesoole mid ka mid ah dhinacyada lamaanayaasha ah ee iska soo horjeeda ay barbaro yihiin.
 - b dhinacyada barbaraha ah ee koortu waa salalka koorta
 - t dhinacyada aan ahayn barbaraha ee koortu waa adimada koorta
 - j fogaanta qotonka u dhexeeya salalka koortu waa joogga koorta.
 - x xariijinta isku xidha bar bartameedyada dhinacyada aan ahayn barbaraha ee koorta waxaa lagu magacaabaa dhextaal koorta.
- 3 Koor labaale ah waa koorta labadeeda dhinac ee aan barbaraha ahayni isku sargo`an yihiin.
- 4 Barbaroole waa afargeeslaha labada lamaaneyaasha ee dhinacyada iska horjeedaa ay yihiin barbaro.barbarroole kasta.
 - b dhinacyada iska soo horjeeda way isku sargo`an yihiin
 - t xaglaha iska soo horjeedaa way isku sargo`an yihiin
 - j xaglo-gooyeyaashu way is kala badhaan
 - x xaglaha isku xigaa way is dhanneeyaan

- 5** Laydi waa barbarroole leh hal xagal qumman.
- b** dhamaan xaglaha laydigu waa xaglo quman
- t** xaglo-gooyeyaasha laydigu way isku sargo`an yihiin
- 6** Qaedhaas waa barbarroolaha labadiisa dhinac ee deriska ah ay isku sargo`an yihiin.
- b** dhamaan dhinacyada qardhaastu way isku sargo`an yihiin
- t** xaglo- gooyeyaashu qardhaastu way iskala badhaan si isku qotonta midba midka kale.
- j** xaglo-gooyeyaasha way kala badhaan xagasha raaran.
- 7** Labajibbaarane waa laydi iyo qardhaas labadaba.
- 8** Geesoole waa hilin si fudud ugu oodan xariijimo.
- b** geesoole tuur leh waa geesoolaha cabbirka xaglo-gudedyadiisu ka yar yihiin 180° mid walba.
- t** geesoole golxo leh waa geesoolaha leh ugu yaraan hal xaglo-gudeed oo cabbirkeedu ka wayn yahay 180°.
- 9** Goobo waa urur baro oo fogaan isle`eg u wada jira bar maguuraan ah oo la yidhaahdo xudunta goobada.
- b** gacanka goobo waa xariijin kabilaabmeta xudunta oo ku dhamaata bartii doonto baraha goobada dusheeda.
- t** boqonka goobo waa xariijinta isku xusta laba barood oo goobada dusheeda ah
- j** dhexroorka goob waa boqonka ugu dheer kaasoo ka gudba xudunta goobada.
- x** qaansada goobo waa qeyb kastoo goobada ah
- 10** Haddii dhinaca saddexagal ee gees kasta la fidiyo, xagasha ay la samayso dhinaca la deriska ah waxaa lagu magacaabaa xaglo-dibadeedka saddexagalka.
- b** gees kasta xaglo-qudeedka iyo xaglo-dibadeedku way isku isbuuxshaan.

t Gees kasta, waxaa jira laba xaglo-dibadeed kuwaas oo ah isku foodsar ah.

11 Wadarta cabbirada xaglo-qudeedyada n – geesoole = $(n - 2)180^\circ$

12 Geesoole qaabsan waa geesoolaha ay dhamaan dhinacyadiisu isku sargo'an yihiin islamarkaana dhamaan xaglahiisu ay isku sargo'an yihiin.

13 Cabbirka xaglo-qudeed kasta ee geesooleha qaabsan,

$$n - \text{dhinacyada} = \frac{(n - 2) \times 180^\circ}{n}.$$

14 Bed

b Bedka (A) ee saddexagal kastaa wuxu le'eg yahay bedhka taranta salka (b) iyo joogga (h) ku beegan salkaas

t Bedka (A) ee barbarroole wuxu le'eg yahay taranta salka (b) iyo joogga (h) eek u beegan.

j Bedka (A) ee koortu waxay le'eg tahay badhka wadarta salalka (b_1) iyo (b_2) lagu dhuftay jooggiisa (h)

$$A = \frac{1}{2}(b_1 + b_2) h$$

x Bedka (A) ee goobo wuxu le'eg yahay taranta π iyo laba jibbaarka gacankeeda.

$$A = \pi r^2$$

kh Bed-duleedka (A_L) ee biriisatn quman wuxu le'eg yahay taranta wareegga (P) ee salka iyo joogga birisamka.

$$A_L = ph$$

d Wadarta bed-duleedka (A_T) ee biriisam quman wuxu le'eg yahay wadarta beddnleedyada dadbiraha iyo beddka salalka ($2A_b$)

$$\text{T.a } A_T = A_L + 2A_b$$

$$\Rightarrow A_T = ph + 2A_b$$

r Wadarta bed-duleedka (A_T) ee biriisan laydiah wuxu le'eg yahay wadarta bedadka dhammaan wajiyadiisa.

$$A_T = 2(Lh + wh + Lw)$$

- s** Bed-duleedka dadabta (A_L) ee dhululo wuxu le'eg yahay taranta meeriska salak (c) iyo jooggiisa (h).

$$A_L = ch, \text{ halka } c \text{ u taagan tahay meeriska}$$

$$\Rightarrow A_L = 2\pi rh$$

- sh** Wadarta bed-duleedka (A_T) ee dhululbo waxay le'eg tahay wadarta bed-duleedka dadabta iyo bedka salaka.

$$A_T = A_L + 2A_B$$

$$\Rightarrow A_T = 2\pi rh + 2\pi r^2$$

$$\Rightarrow A_T = 2\pi r(h + r)$$

- 15** Wadarta dhererada dhinacyada geesoole waxa la yidhaa wareegga geesoolha.

- 16** Meeriska goobo waa fogaanta wareegga goobo.

- 17** Meeriska (c) ee goobo wuxu le'eg yahay π lagu dhuftay dhexroorka ama π lagu dhuftay laban laabka gacankeed.

$$C = \pi d \text{ ama } C = 2\pi r$$

- 18** Biriisam waxa la odhan karaa waa biriisam quman haddii geerarka dadabtu ku qotomaan salka, haddii kale waa biriisam janjeedha.

- 19** Biriisamka leh sal goobo waxal la yidhaa dhululbo.

- 20** Mugga biriisam kasta wuxu le'eg yahay taranta bedka salka iyo jooggiisa.

$$V = A_B h$$

V – waa muq

A_B – bedka salka

h – joogga biriisamka

- 21** Mugga dhululbo waxay le'eg tahay taranta bedka salka iyo jooggiisa.

$$t, a, v = A_B h$$

$$\Rightarrow V = \pi r^2 h$$

- 22** Dhererka dhinac kasta ee saddexagal wuxu noqon karaa salka saddexagalka, qotonka fogaanta geeska ka soo horjeedaa u jirta salka waxa la yidhaa joogga saddexagalka.

? Lylisyada guud ee Cutubka 5^{aad}

- 1 Saamiga laba xaglood ee barbarroole waa 4:5. Raadi xaglaha barbarrolaha.
- 2 Xaglo-dibadeedka qardhaas ayaa ah 115° . Raadi cabbirka xaglo-gudeedyada ee qardhaasta.
- 3 Koorta PQRS, $\overline{PQ} \parallel \overline{RS}$. Haddii $\angle Q = 110^\circ$ waa imisa $\angle R$ islamarkaa sababta sheeg?
- 4 Saamiga xaglaha afargeesoole waa 3:6:2:4. Raadi cabbirka xaglaha.
- 5 Afar geesoole xaglihiisu waa x° , $3x^\circ$, $2x^\circ$, iyo $6x^\circ$, Raadi cabbirka xaglaha.
- 6 Waa imisa wadarta xaglo-qudeedyada geesoole, halka tirada dhinacyadu "n" yihiin

b 11 **t** 9 **j** 30 **x** 36

kh 90 **d** 1002

- 7 Miyuujiraa geesoole tuur leh oo ay wadarta xaglo-gudeedyade u leedahay tahay:

b $1360^\circ?$ **t** $2340^\circ?$ **j** $3160^\circ?$ **x** $3600^\circ?$

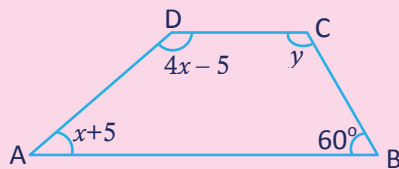
- 8 Gees kasta ee geesoole qaabsan, haddii aan ka sawirno 12 xaglo-gooyeyaal, raadi:

b wadarta xaglo-gudeedyada geesooleha

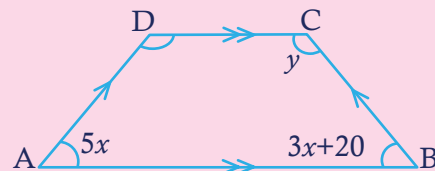
t xaglo-gudeedyada geesooleha cabbir mid walba.

- 9 Kooraha hoos lagu siiyey mid walba, raadi xaglaha u taagan x iyo y .

b

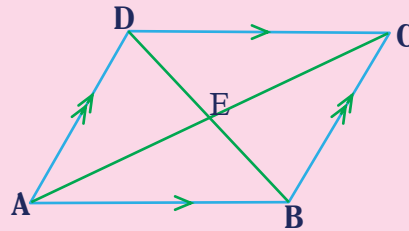


t



Jaantuska 5.75

Su'aalaha 10-13 tixraac barbarroolaha ABCD ee shaxanka.



Jaantuska 5.76

- 10** Haddii $m(\angle DAB) = 4x - 60$ islamarkaana $m(\angle DCB) = 30 - x$, kolkaa raadi
- b** $m(\angle DAB)$ **t** $m(\angle DCB)$
- j** $m(\angle ABC)$ **x** $m(\angle CDA)$.
- 11** Haddii $m(\angle DCB) = a + 12$ islamarkaana $m(\angle CDA) = 4a + 18$ raadi cabbirka xaglaha barbaroolaha .
- 12** Haddii $AB = 4x + y$, $BC = y + 4$, $CD = 3x + 6$, $DA = 2x + y$ raadi dhererka dhinacyada barbaroolaha.
- 13** Haddii $AE = 5x - 3$ islamarkaa $EC = 15 - x$, raadi AC.
- 14** Dhisme:
- b** dhis koorta ABCD, $\overline{AB} \parallel \overline{CD}$ ee $AB = 5\text{cm}$, $BC = 6\text{cm}$, $CD = 8\text{cm}$ islamarkaa $m(\angle ABC) = 115^\circ$
- t** dhis qardhaasta ABCD ee $AB = 8\text{cm}$ islamarkaa $m(\angle ABC) = 85^\circ$.
- j** dhis barbaroolaha ABCD ee $AB = 7\text{cm}$, $\angle A = 60^\circ$ islamarkaa $AD = 4\text{cm}$.
- x** dhis labajibbaarane dhiniciisu yahay 10cm.
- 15** Xagaha afargeesoole waa 1:4:5:8 saami ahaan
- b** raadi cabbiraadda xaglaha dhammaantood ee afargeesoolaha.
- t** afargeesoolahani ma koorbaa? Sabab?
- j** afar geesalahani ma barbaroolaa? Sabab?