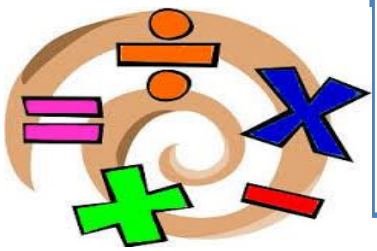
স্বাগতম

সুমন চক্রবর্তী

ইন্সট্রাক্টর (নন-টেক) গণিত

বাংলাদেশ সার্ভে ইনস্টিটিউট ,কুমিল্লা



1.1 What is mathematics?

Soln : Mathematics is the Souls Of Science.

OR

Soln:Mathematics is the science Which draws necessary conclutions.

৩য় পর্ব

welq t gv_‡gwU·-3

welq †KvW t 25931

b¤^i e›Ub t

ZvwËi¡K b¤^i		eënvwiK b¤^i	me©‡gvU b¤^i
ZvwËi¡K avivevwnK	ZvwËi¡K mgvcbx (dvBbvj)	eënvwiK avivevwnK	
60	**90**	**50**	**200**

Aaÿq bs t 1

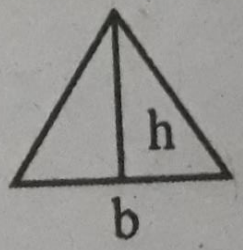
Aaÿ‡qi bvg t
(wÎfz‡Ri †ÿÎdj)

সমকোণী ত্রিভুজ

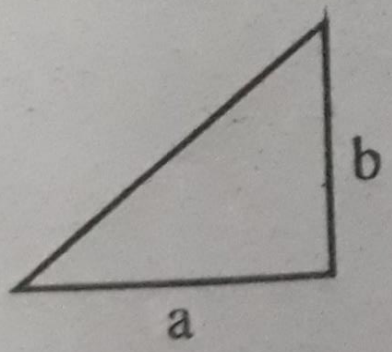
১। $(\text{ভূমি})^2 + (\text{লম্ব})^2 = (\text{অতিভুজ})^2$

ত্রিভুজ

১। ত্রিভুজের ক্ষেত্রফল, $A = \frac{1}{2} \times \text{ভূমি} \times \text{উচ্চতা} = \frac{1}{2}\ bh$; এখানে, b = ভূমি, h = উচ্চতা



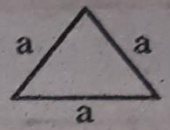
২। সমকোণী ত্রিভুজের ক্ষেত্রফল, $A = \frac{1}{2} \times$ ভূমি $\times$ লম্ব



$= \frac{1}{2} \times$ সমকোণ সংলগ্ন বাহুদ্বয়ের গুণফল

$= \frac{1}{2}\ ab.$

৩। সমবাহু ত্রিভুজের ক্ষেত্রফল, $A = \frac{\sqrt{3}}{4} \times (\text{বাহু})^2 = \frac{\sqrt{3}}{4} a^2$; এখানে, a = বাহু



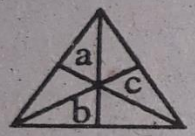
সমবাহু ত্রিভুজের উচ্চতা, $h = \frac{\sqrt{3}}{2} a$; এখানে, a = বাহু

৪। সমদ্বিবাহু ত্রিভুজের ক্ষেত্রফল, $A = \frac{c}{4}\sqrt{4a^2 - c^2}$

এখানে, a = সমান বাহু, c = ভূমি অথবা, তৃতীয় বাহু

৫। ত্রিভুজের ক্ষেত্রফল, $A = \sqrt{s(s-a)(s-b)(s-c)}$; যখন a, b, c তিনটি বাহু এবং $s = \frac{a+b+c}{2}$

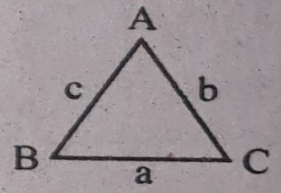
৬। ত্রিভুজের ক্ষেত্রফল , $A = \frac{4}{3}\sqrt{s(s-a)(s-b)(s-c)}$



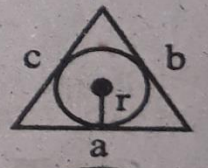
যখন মধ্যমাত্রয় a, b, c এবং $s = \frac{a+b+c}{2}$

এই সূত্রটিকে MR এর সূত্র বলে।

৭। ত্রিভুজের ক্ষেত্রফল, $A = \frac{1}{2} ab \sin C = \frac{1}{2} bc \sin A = \frac{1}{2} ca \sin B$



৮। ত্রিভুজের ক্ষেত্রফল, $A = \frac{1}{2}(a+b+c) \times r$; এখানে, r = অন্তঃবৃত্তের ব্যাসার্ধ।

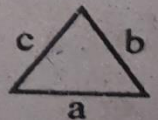


৯। ত্রিভুজের ক্ষেত্রফল, $A = \frac{abc}{4R}$

এখানে, বাহুত্রয় a, b, c এবং পরিবৃত্তের ব্যাসার্ধ = R

১০। ত্রিভুজের পরিসীমা, $2s = a + b + c$

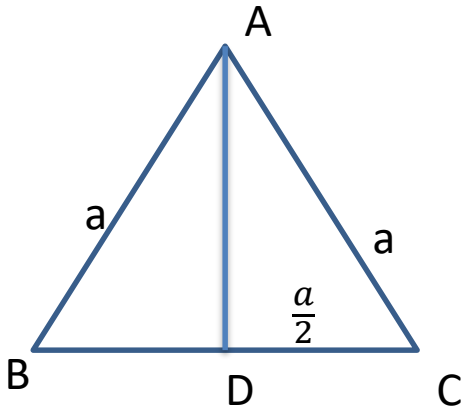
যখন বাহুদ্বয় a, b, c.



AwZ msw¶ß:

1. a GKK evû wewkó mgevû wÎfy‡Ri D”PZv KZ n‡e ?

mgvavb: GLv‡b, AB=BC = CA= a



D,BC Gigaïwe›`y|

$\therefore BD = DC = \frac{a}{2}$

GLb, ABD wÎfyRn‡Z

$AD^2 = AB^2 - BD^2$

$= a^2 - (\frac{a}{2})^2$

$= a^2 - \frac{a^2}{4}$

$= \frac{4a^2 - a^2}{4} = \frac{3a^2}{4}$

$\therefore AD = \frac{\sqrt{3}a}{2}$

∴ wÎfy‡Ri D”PZv $\frac{\sqrt{3}a}{2}$ GKK (Ans.)

2.(i). x cwimxgv wewkó GKwU mgevû wÎfy‡Ri †¶Îdj KZ ?

mgvavb: †`Iqv Av‡Q, mgevû wÎfy‡Ri cwimxgv = x

∴mgevû wÎfy‡Ri GK evû a= $\frac{x}{3}$

Avgiv Rvwb,

mgevû wÎfy‡Ri †¶Îdj $=\frac{\sqrt{3}a^2}{4}$

$$=\frac{\sqrt{3}(\frac{x}{3})^2}{4}$$

$$=\frac{\sqrt{3}x^2}{4.9}$$

$$=\frac{\sqrt{3}x^2}{36}(\text{Ans.})$$

2.(ii). a cwimxgv wewkó mgevû wÎfy‡Ri †¶Îdj KZ ?

3.GKwU wÎfy‡Ri wZb evûi ˆN©¨ 5,12,13GKK n‡j wÎfy‡Ri †¶Îdj KZ ?

mgvavb: wÎfy‡Ri wZbevûi ˆN©¨5,12,13 GKK

∴wÎfyRwU mg‡KvYx|

wÎfy‡Ri †¶Îdj= $\frac{1}{2}$ ×fywg×D”PZv

$=\frac{1}{2}\times 12\times 5$

=30 eM© GKK (Ans.)

4. c f~wg wewkó mgwØevû wÎfy‡Ri †¶Îdj wbY©‡qi m~ÎwU wjL |

DËi: c f~wg wewkó mgwØevû wÎfy‡Ri †¶Îdj= $\frac{c}{4}\sqrt{4a^2 - c^2}$

5.(i). GKwU mgevû wÎfy‡Ri D”PZv a n‡j Gi †¶Îdj KZ ?

mgvavb: g‡bKwi,mgevû wÎfy‡RiGK evû = x

∴mgevû wÎfy‡Ri D”PZv = $\frac{\sqrt{3}x}{2}$

kZ©মত‡Z, $\frac{\sqrt{3}x}{2} = a$

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

সgevû wÎfy‡Ri †¶Îdj= $\frac{\sqrt{3}x^2}{4}$

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

$$= \frac{a^2}{\sqrt{3}} \text{ (Ans.)}$$

5.(ii).GKwU mgevû wÎfy‡Ri D”PZv $3\sqrt{3}$GKK n‡j,evûi ¯’N©¨KZ ?

mgvavb: g‡b Kwi,mgevû wÎfy‡Ri GK evû = x

∴mgevû wÎfy‡Ri D”PZv = $\frac{\sqrt{3}x}{2}$

kZ©g‡Z, $\frac{\sqrt{3}x}{2} = 3\sqrt{3}$

$x = 6$

∴ mgevû wÎfy‡Ri evû 6 GKK (Ans.)

8.GKwU mg‡KvYx wÎfy‡Ri f~wg 8 wgt Ges AwZfyR 10 wgt n‡j †¶Îdj KZ?

mgvavb: ‡`Iqv Av‡Q,

mg‡KvYx wÎfy‡Ri f~wg 8 wgt

Ges AwZfyR10 wgt

∴ wÎfy‡Ri D”PZv= $\sqrt{(\text{AwZfyR})^2-(\text{f~wg})^2}$

$= \sqrt{(10)^2-(8)^2}$

$= \sqrt{100-64}$

$= \sqrt{36}$

$= 6$

∴ wÎfy‡Ri†¶Îdj= $\frac{1}{2}$ ×fywg×D”PZv

$= \frac{1}{2} \times 8 \times 6$

= 24 eM© wgt(Ans.)

9.(i). a evû wewkó mgevû wÎfy‡Ri †¶Îdj wbY©‡qi m~ÎwU wjL |

DËi:aevû wewkó mgevû wÎfy‡Ri †¶Îdj

$$=\frac{\sqrt{3}a^2}{4}$$

9.(ii). x evû wewkó mgevû wÎfy‡Ri †¶Îdj wbY©‡qi m~ÎwU wjL |

DËi:xevû wewkó mgevû wÎfy‡Ri †¶Îdj

$$=\frac{\sqrt{3}x^2}{4}$$

13.(i).GKwU mgevû wÎfy‡Ri †¶Îdj$9\sqrt{3}$Gi cwimxgv KZ ?

mgvavb: g‡b Kwi,mgevû wÎfy‡Ri GK evû = x

∴mgevû wÎfy‡Ri †¶Îdj= $\frac{\sqrt{3}x^2}{4}$

kZ©মত‡Z, $\frac{\sqrt{3}x^2}{4} = 9\sqrt{3}$

$\Rightarrow x^2 = 36$

$\therefore x = 6$

∴ mgevû wÎfy‡Ri cwimxgv = 6×3

= 18(Ans.)

(ii).GKwU mgevû wÎfy‡Ri †¶Îdj$16\sqrt{3}$Gi cwimxgv KZ ?

14.GKwU mgevû wÎfy‡Ri cwimxgv 162 †mwgt n‡j wÎfy‡Ri †¶Îdj KZ?

mgvavb: ‡`Iqv Av‡Q, mgevû wÎfy‡Ri cwimxgv162 †mwgt

∴ mgevû wÎfy‡Ri GK evû = $\frac{162}{3}$†mwgt

= 54 †mwgt

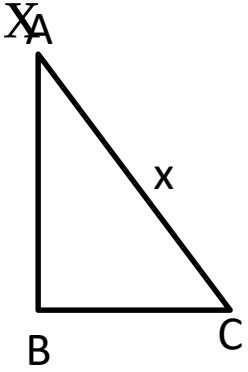
Avgiv Rvwb, mgevû wÎfy‡Ri †¶Îdj= $\frac{\sqrt{3}x^2}{4}$

= $\frac{\sqrt{3}\,(54)^2}{4}$eM© †mwgt

= 1262.66 eM© †mwg(Ans.)

15.GKwU mg‡KvYx mgwØevû wÎfy‡Ri AwZfyR x wgUvi n‡j Zvi †¶Îdj KZ?

mgvavb:g‡bKwi,ABC GKwU mg‡KvYx mgwØevû wÎfyR| Gi AwZfyR $AC = x$ wgUvi



kZ©মতে, $AB^2+BC^2 = AC^2$

$2AB^2 = x^2$ [‡h‡nZz AB=BC]

$AB^2 = \frac{x^2}{2}$

$AB = \frac{x}{\sqrt{2}} = BC$

mg‡KvYx wÎfy‡Ri †¶Îdj

$= \frac{1}{2} \times$ fywg×D”PZv

$= \frac{1}{2} \times \frac{x}{\sqrt{2}} \times \frac{x}{\sqrt{2}}$

$=$

$\frac{x^2}{}$ eM©wgUvi(Ans.)

16.GKwU mgevû wÎfy‡Ri †¶Îdj $24\sqrt{3}$eM© GKK n‡j,Gi evûi ˆN©¨KZ ?

mgvavb: g‡b Kwi,mgevû wÎfy‡Ri GK evû = x

∴mgevû wÎfy‡Ri †¶Îdj= $\frac{\sqrt{3}x^2}{4}$

kZ©মত‡Z, $\frac{\sqrt{3}x^2}{4} = 24\sqrt{3}$

$x^2 = 96$

$x = 9.79$

∴ mgevû wÎfy‡Ri evûi ‰`N© =9.79 GKK (Ans.)

17. GKwU mgevû wÎfy‡Ri evû 10 †mwgt n‡j Dnvi †¶Îdj KZ ?

mgvavb: ‡`Iqv Av‡Q, mgevû wÎfy‡Ri evûi ‰`N© a=10 †mwgt

Avgiv Rvwb, mgevû wÎfy‡Ri †¶Îdj= $\frac{\sqrt{3}a^2}{4}$

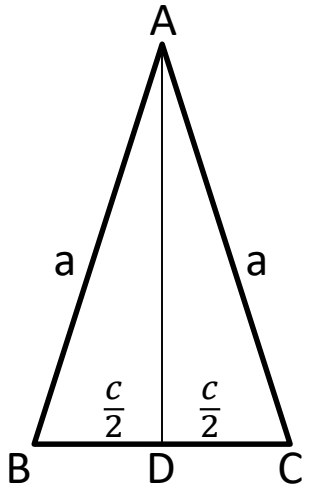
$= \frac{\sqrt{3}(10)^2}{4}$ eM© †mwgt

$= \frac{\sqrt{3}.100}{4}$ eM© †mwgt

$= 25\sqrt{3}$eM© †mwgt(Ans.)

18.mgvb evû a Ges Amgvb evû c n‡j mgwØevû wÎfy‡Ri D"PZv KZ ?

mgvavb: ‡`Iqv Av‡Q, mgvb evûAB=AC=a Ges Amgvb evû BC=c



GLb, ABD wÎfyR n‡Z

$$AD^2 = AB^2 - BD^2$$

$$= a^2 - \left(\frac{c}{2}\right)^2$$

$$= a^2 - \frac{c^2}{4}$$

$$= \frac{4a^2 - c^2}{4}$$

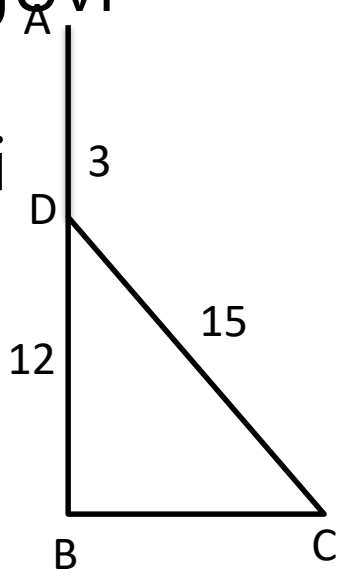
$$\therefore AD = \frac{\sqrt{4a^2 - c^2}}{2}$$

∴ wÎfy‡Ri D"PZv $\frac{\sqrt{4a^2 - c^2}}{2}$ (Ans.)

msw¶ß

5.(i).15 wgUvi `xN© GKwU gB GKwU †`qv‡j Luvov Ae¯'vq Av‡Q| gB Gi †Mvov †`qvj n‡Z KZ`~i miv‡j Gi AMÖfvM 3 wgUvi m‡i Avm‡e ?

mgvavb: GLv‡b, AB=CD=15 wgUvi



AD= 3 wgUvi

∴BD = AB- AD= 15-3=12 wgUvi

BCD wÎfzRn‡Z,

$BC^2 = CD^2 - BD^2$

$= (15)^2 - (12)^2$

$= 225 - 144$

$= 81$

$= 9$

Gi †Mvov †`qvj n‡Z 9 wgUvi m‡i Avm‡e| (Ans.)

5.(ii).15 wgUvi `xN© GKwU gB GKwU †`qv‡j Luvov Ae¯’vq Av‡Q| gBwUi †Mvov †`qvj n‡Z 9 wgUvi miv‡j Zvi AMÖfvM KZ wgUvi wb‡P bvg‡e ?

mgvavb: GLv‡b,gBGi ‰ `N©

AB=CD=15

wgUvi,BC=9 wgUvi

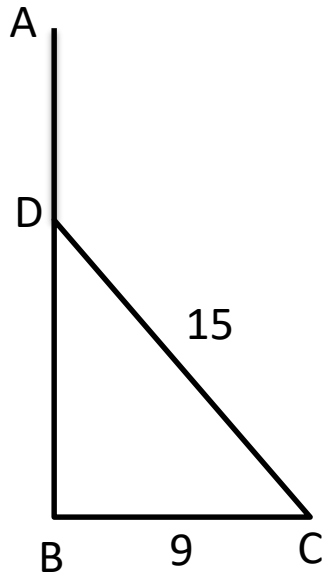
BCD wÎfzR n‡Z,

$BD^2 = CD^2 - BC^2$

$= (15)^2 - (9)^2$

$= 225 - 81$

$= 144$



∴BD = 12

∴ AD=15-12= 3 wgUvi

gBGi AMÖfvM 3 wgUvi wb‡P bvg‡e|

(Ans.)

9.GKwU mgwØevû mg‡KvYx wÎfy‡Ri cwimxgv $\sqrt{2}+1$ †`Iqv Av‡Q| AwZfyR wbY©q Ki|

mgvavb: g‡b Kwi, ABC GKwU mgwØevû mg‡KvYx wÎfyR| GiAB = BC = x wgUvi

kZ©¸‡Z, $AC^2 = AB^2 + BC^2$

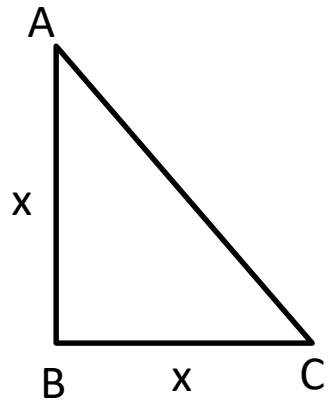
$= x^2 + x^2 = 2x^2$

AwZfyR $AC = \sqrt{2}x$

cÖkœg‡Z, $AB + BC + AC = \sqrt{2}+1$

- $x + x + \sqrt{2}x = \sqrt{2}+1$
- $2x + \sqrt{2}x = \sqrt{2}+1$
- $\sqrt{2}x(\sqrt{2}+1) = \sqrt{2}+1$

$\sqrt{2}x = 1 \quad \therefore \quad x = \frac{1}{\sqrt{2}}$



∴AwZfyR $AC = \sqrt{2}x = \sqrt{2}.\frac{1}{\sqrt{2}} = 1$(Ans.)

8.GKwU mg‡KvYx mgwØevû wÎfy‡Ri cwimxgv $4\sqrt{2}+4$ Gi

12.(i).GKwU mgwØevû wÎfy‡Ri mgvbevûi ˆ`N©¨ Z…Zxqevûi $\frac{5}{6}$ Ask Gi cwimxgv 40 †mwgt n‡j †¶ÎdjKZ ?

mgvavb: g‡bKwi, ABC GKwU mgwØevû wÎfyR |

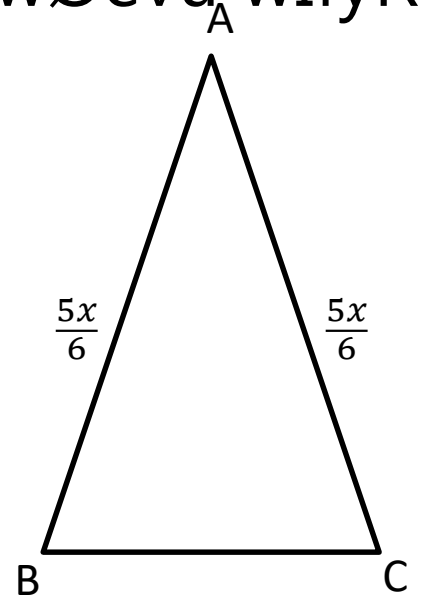
Fywg c = BC = x

Mgvb evûi ˆ`N©¨= x Gi $\frac{5}{6} = \frac{5x}{6}$

cÖkœg‡Z, AB+BC+AC=40

- $\frac{5x}{6}+\frac{5x}{6}+x = 40$
- $\frac{5x+5x+6x}{6} = 40$
- $\frac{16x}{6} = 40$
- $x = \frac{6\times40}{16}$

$\therefore \quad x = 15$



mgvb evûi ^N©¨a = $\frac{5\times15}{6}$ =12.5

wÎfy‡Ri †¶Îdj= $\frac{c}{4}\sqrt{4a^2-c^2}$

$=\frac{15}{4}\sqrt{4(12.5)^2-(15)^2}$

$=\frac{15}{4}\sqrt{400}$

$=\frac{15}{4}\times 20$

=75eM© †mwgt(Ans.)

Same:

11.(i).GKwU mgwØevû wÎfy‡Ri cwimxgv 16 wgUvi | Gi mgvb mgvb evûi ‡N©¨f~wgi $\frac{5}{6}$ Ask n‡j ,wÎfy‡Ri †¶Îdj †ei Ki|

(ii). GKwU mgwØevû wÎfy‡Ri mgvb evûi ‡N©¨ Z...Zxq evûi $\frac{5}{6}$ Ask Gi cwimxgv 96 †mwgt n‡j †¶Îdj KZ ?

13.GKwU mgwØevû wÎfy‡Ri cwimxgv 50 †mtwgt Gi mgvb evûØ‡qi cÖ‡ZKwUi ‡N©¨Amgvb evûi ‡‡N©i¨ $\frac{3}{4}$ Ask, wÎfyRwUi †¶Îdj KZ ?

12.(ii).GKwU mgwØevû wÎfy‡Ri mgvb evûi ¯^N©¨ Z…Zxq evûi $\frac{5}{8}$ Ask ,Gi †¶Îdj 300 eM© wgt n‡j;Gi cwimxgv wbY©q Ki |

mgvavb:g‡b Kwi, ABC GKwU mgwØevû wÎfyR |

ভুwg c = BC = x

সgvb evûi ¯^N©¨= x Gi $\frac{5}{8} = \frac{5x}{8}$

cwimxgv = AB+BC+AC

$$= \frac{5x}{8} + \frac{5x}{8} + x$$

$$= \frac{5x+5x+8x}{6}$$

$$= \frac{18x}{8}$$

$$= \frac{9x}{4}$$

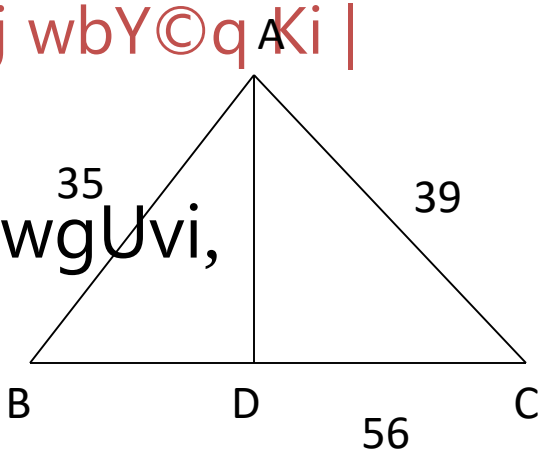
wÎfy‡Ri †¶Îdj= $\frac{c}{4}\sqrt{4a^2 - c^2}$

- $300 = \frac{x}{4}\sqrt{\{(4(\frac{5x}{8})^2 - (x)^2\}}$
- $300 = \frac{x}{4}\sqrt{\{(4(\frac{25x^2}{64}) - x^2\}}$
- $300 = \frac{x}{4}\sqrt{(\frac{25x^2}{16} - x^2)}$
- $300 = \frac{x}{4}\sqrt{(\frac{25x^2 - 16x^2}{16})}$
- $300 = \frac{x}{4}\sqrt{(\frac{9x^2}{16})}$
- $300 = \frac{x}{4} . \frac{3x}{4}$
  - $x^2 = \frac{16 \times 300}{3}$
  - $x^2 = 1600$

$\therefore \quad x = 40$

$\therefore$cwimxgv = $\frac{9x}{4} = \frac{9 \times 40}{4} = 90$wgt

18. GKwU wÎfy‡Ri wZbwU evû h_vµ‡g 35,39,56 wgUvi Gi e„nËg evûi wecixZ kxl© n‡Z Gi Dci AswKZ j¤^ Øviv wÎfyRwU †h `yÕwU As‡k wef³ nq Zv‡`i †¶Îdj wbY©q Ki |



mgvavb:GLv‡b,ABC wÎfy‡Ri AB=35 wgUvi,

BC= 39 wgUvi, AC = 56 wgUvi

$$S=\frac{a+b+c}{2}=\frac{35+39+56}{2}=\frac{130}{2}=65 \text{ wgUvi}$$

ABC wÎfy‡Ri †¶Îdj= $\sqrt{s(s-a)(s-b)(s-c)}$

$$=\sqrt{65(65-35)(65-39)(65-56)}$$

$$=\sqrt{65.30.26.9}$$

$$=\sqrt{456300}$$

= 675.49 eM©wgUvi

Avevi, ABCwÎfy‡Ri †¶Îdj= $\frac{1}{2}$ ×fywg×D”PZv

$\Rightarrow$ 675.49= $\frac{1}{2}$ ×56 ×AD

$\Rightarrow$ 675.49= 28AD

∴AD = 24.12

ABDwÎfyRn‡Z,

$BD^2 = BC^2-AD^2$

$= (35)^2-(24.12)^2$

$= 1225-581.77$

$= 643.22$

∴BD = 25.36

GLb, ABDwÎfy‡Ri †¶Îdj= $\frac{1}{2}$ ×fywg×D”PZv

= $\frac{1}{2}$ ×25.36 ×24.12(Ans.)

= 305.86 eM©wgUvi

∴ACDwÎfy‡Ri †¶Îdj= (675.49-305.86) eM©wgUvi

= 369.63 eM©wgUvi (Ans.)

Same:

15. GKwU wÎfy‡Ri evûi ˆN© h_vµ‡g 25,20,15 e„nËg evûi wecixZ ‡Kvb n‡Z AswKZ j¤^ wÎfyRwU‡K †h `yÕwU wÎfy‡R wef³ K‡I G‡`i †¶Îdj wbY©q Ki |
16. GKwU wÎfy‡Ri wZbwU evûi ˆN© 75,60,45 ‡m.wgUvi e„nËg evûi wecixZ kxl© n‡Z AswKZ j‡¤i^ ˆN¨wbY©q Ki |
17. GKwU wÎfy‡Ri evûi ˆN© h_vµ‡g 51,37,20 ‡m.wgUvi Gi †¶Îdj ‡ei Ki|Ges 20 ‡m.wgUvi evûi wecixZ ‡KvY n‡Z AswKZ j‡¤i^ ˆN¨wbY©q Ki |

19.(ii). GKwU wÎfy‡Ri evû¸‡jvi AbycvZ 3 t 4 t 5 Ges cwimxgv 48 wgUvi n‡j AwZfyR KZ n‡e ?

mgvavb:awi,wÎfy‡Ri evû¸‡jv a = 3x, b = 4x, c = 5x
Ges cwimxgv= 48 wgUvi

cÖkœg‡Z, $3x+4x+5x = 48$

$\Rightarrow 12x = 48$

$\therefore \ x = 4$

evû¸‡jv : a = 3.4=12 wgUvi

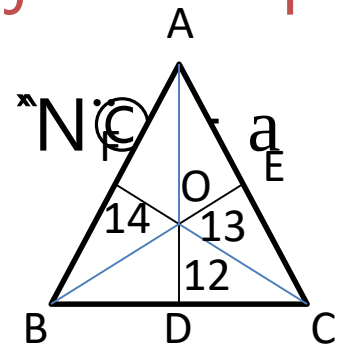
b = 4.4=16 wgUvi

c = 5.4=20 wgUvi

$\therefore \ a^2+b^2 = c^2$

∴ AwZfyR 20 wgUvi(Ans.)

25.GKwU mgevû wÎfy‡Ri wfZi¯Í †Kvb GKwU we›`y n‡Z evûÎ‡qi Dci AswKZ j‡¤^i ‡N©¨h_vµ‡g 12,13,14 ‡mt wgt n‡j wÎfy‡Ri evûi ‡N©¨Ges ‡¶Îdj wbY©q Ki|



mgvavb: g‡b Kwi,mgevû wÎfy‡Ri evûi ‡N©¨Ges = a

Avgiv Rvwb,mgevû wÎfy‡Ri †¶Îdj= $\frac{\sqrt{3}a^2}{4}$

GLv‡b, OD=12, OE=13, OF=14

BOC wÎfy‡Ri ‡¶Îdj= $\frac{1}{2}\times BC\times OD=\frac{1}{2}\times a\times 12=6a$

AOC wÎfy‡Ri ‡¶Îdj= $\frac{1}{2}\times AC\times OE=\frac{1}{2}\times a\times 13=\frac{13a}{2}$

AOB wÎfy‡Ri ‡¶Îdj= $\frac{1}{2}\times AC\times OE=\frac{1}{2}\times a\times 14=7a$

cÖkœg‡Z, $\frac{\sqrt{3}a^2}{4} = 6a + \frac{13a}{2} + 7a$

- $\frac{\sqrt{3}a^2}{4} = \frac{12a+13a+14a}{2}$
- $\frac{\sqrt{3}a^2}{4} = \frac{39a}{2}$
- $\frac{\sqrt{3}a}{2} = \frac{39}{1}$
- $a = \frac{39.2}{\sqrt{3}}$

$\therefore a = 26\sqrt{3}$

∴evûi ¯‹N© = $26\sqrt{3}$ ‡mtwgt(Ans.)

∴wÎfy‡Ri †¶Îdj= $\frac{\sqrt{3}(26\sqrt{3})^2}{4}$ = 878.14 eM© ‡mtwgt(Ans.)

Same:

24. GKwU mgevû wÎfy‡Ri wfZi¯’ †Kvb GKwU we›`y n‡Z evûÎ‡qi Dci AswKZ j‡¤^i ”N©¨h_vµ‡g 6,7,8 ‡mt wgt n‡j wÎfy‡Ri evûi ”N©¨Ges ‡¶Îdj wbY©q Ki |

26.(i).GKwU mgevû wÎfy‡Ri wfZi¯Í GKwU we›`y n‡Z evûÎ‡qi Dci AswKZ j‡¤^i ”N©¨h_vµ‡g 10,12,14 wgt| wÎfy‡Ri evûi ”N©¨Ges ‡¶Îdj ‡ei Ki |

(ii).GKwU mgevû wÎfy‡Ri A¯Í¯’t †Kvb GKwU we›`y n‡Z evûÎ‡qi Dci AswKZ j‡¤^i ”N©¨h_vµ‡g 10,11,12 wgt| wÎfy‡Ri evûi ”N©¨Ges ‡¶Îdj wbY©q Ki |

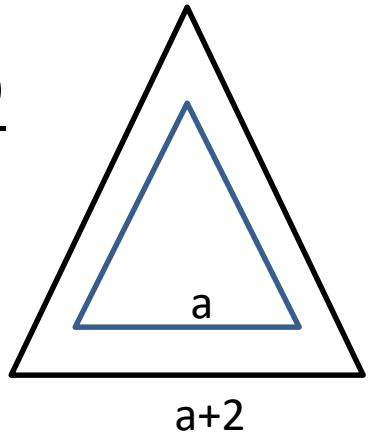
30.GKwU mgevû wÎfy‡Ri evûi ˆN© 2 wgt evov‡j Gi ‡¶Îdj $3\sqrt{3}$ eM© wgUvi †e‡o hvq| mgevû wÎfy‡Ri evûi ˆN©¨Ges ‡¶Îdj wbY©q Ki|

mgvavb: g‡b Kwi,mgevû wÎfy‡Ri evûi ˆN© = a

Avgiv Rvwb, mgevû wÎfy‡Ri †¶Îdj= $\frac{\sqrt{3}a^2}{4}$

Evûi ˆN¨2wgUvi evov‡j wÎfy‡Ri †¶Îdj=$\frac{\sqrt{3}(a+2)^2}{4}$

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



cÖkœg‡Z, $\frac{\sqrt{3}(a^2+4a+4)}{4} - \frac{\sqrt{3}a^2}{4} = 3\sqrt{3}$

- $\frac{\sqrt{3}(a^2+4a+4-a^2)}{4} = 3\sqrt{3}$
- $\frac{(4a+4)}{4} = 3$

- $\frac{4(a+1)}{4} = 3$
- $a + 1 = 3$

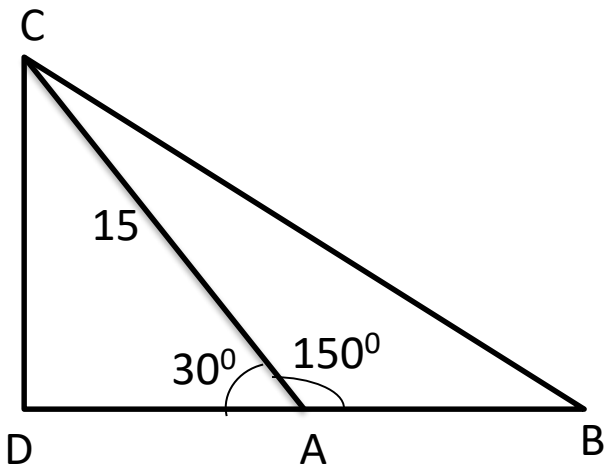
$\therefore a = 3 - 1 = 2$

$\therefore$ mgevû wÎfy‡Ri †¶Îdj $= \frac{\sqrt{3}a^2}{4} = \frac{\sqrt{3}.22}{4} = \sqrt{3}$ (Ans.)

31.GKwU mgevû wÎfy‡Ri cÖwZwU evûi ˆN©¨ 1wgt K‡i evov‡bv n‡j Gi ‡¶Îdj $\sqrt{3}$eM© wgUvi †e‡o hvq| wÎfyRwUi evûi ˆN©¨Ges ‡¶Îdj wbY©q Ki |

iPbvg~jK:

42.(ii).†Kvb GKwU ¯’vb n‡Z `yÕwU †mvRv iv¯Ívi AšÍf©y³ †KvY $150^0$| `yÕwU †jvK H ¯’vb n‡Z GKB mg‡q NÈvq 3 Ges 4 wK‡jvwgUvi †e‡M iIqvbv nj| 5 NÈv ci Zv‡`i g‡a¨mivmwi `~iZ¡ KZ n‡e ?



mgvavb: g‡b Kwi, A n‡Z `yÕRb †jvK h_vµ‡g

3 Ges 4 wK: wg: †e‡M iIqvbv n‡q 5 NÈv ci

C Ges B we›`y‡Z Avmj|

$\overline{AB} = 4.5=20$ wK: wg:

$AC = 3.5=15$ wK: wg:

$\angle BAC= 150^0$, C n‡Z AB evûi ewa©Zvs‡ki Ici CD j¤^ AvuwK|

$CAD =30^0$

ACD wÎfzRn‡ZcvB, $\frac{AD}{AC} = Cos30^0$

$AD = AC \times \frac{\sqrt{3}}{2} = 15 \times \frac{\sqrt{3}}{2} = \frac{15\sqrt{3}}{2} = 12.99$wK: wg:

Ges$\frac{CD}{AC} = Sin30^0$

$CD = AC \times \frac{1}{2} = 15 \times \frac{1}{2} = 7.5$wK: wg:

$BD = AB + AD = 20 + 12.99 = 32.99$wK: wg:

BCD wÎfzRn‡ZcvB,

$BC^2 = CD^2 + BD^2$

$= (7.5)^2 + (32.99)^2$

$= 50.25 + 1088.34$

$= 1144.59$

$\therefore \quad BC = 33.83$

5NÈv ci Zv‡`i g‡a¨mivmwi `~iZ33.83 wK: wg: (Ans.)

Same:

40.GKwU wbw`©ó ¯’vb n‡Z `yÕwU iv¯Ív 120^{0}†Kv‡Y P‡j †M‡Q, `yÕRb †jvK H wbw`ó ¯’vb n‡Z h_vµ‡g 8 wK‡jvwgUvi I10 wK‡jvwgUvi †e‡M wecixZ gywL iIqvbv nj| 5 NÈv ci Zv‡`i g‡a¨mivmwi `~iZ¡ KZ n‡e ?

41.GKwU wbw`©ó ¯’vb n‡Z `yÕwU iv¯Ív 135^{0}†Kv‡Y P‡j †M‡Q, `yÕRb †jvK H wbw`ó ¯’vb n‡Z h_vµ‡g 7 wK‡jvwgUvi I 5 wK‡jvwgUvi †e‡M wecixZ gywL iIqvbv nj| 4 NÈv ci Zv‡`i g‡a¨mivmwi `~iZ¡ KZ n‡e ?

42.(i).†Kvb GKwU ¯’vb n‡Z `yÕwU †mvRv iv¯Ívi AšÍf©y³ †KvY 150$^{0}$| `yÕwU †jvK H ¯’vb n‡Z GKB mg‡q NÈvq 6 Ges 7 wK‡jvwgUvi †e‡M iIqvbv nj| 2 NÈv ci Zv‡`i g‡a¨mivmwi `~iZ¡ KZ n‡e ?


Thank You