CLASS 10 MATHS ASSIGNMENT CHAPTER 13 SIMILARITY

General direction for the students :-Whatever be the notes provided , everything must be copied in the Maths Copy and then do the Home work in the same Copy.

Similar figures:

Two or more figures are said to be similar , if they have same Shape but different in Size.

Eg . A photo and its enlarged copy.

Similarity of Triangles.

Similarity of triangles can be checked by any of the following Rules.

1. SAS rule of similarity

If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional , then the two triangles are similar.

2. SSS rule of similarity

If three sides of one triangle are proportional to the three sides of another triangle , then the two triangles are similar.

3. AA rule of similarity

If two angles of a triangle are equal to two angles of another triangle , then the two triangles are similar.

NOTE

1. If two triangles are similar then their corresponding sides are proportional and angles are equal.

2. If two triangles are similar then ratios of their corresponding sides is equal to ratios of their corresponding Medians .

3. . If two triangles are similar then ratios of their corresponding sides is equal to ratios of their corresponding Altitudes.

4. . If two triangles are similar then ratios of their corresponding sides is equal to ratios of their corresponding Perimeter.

Exercise 13.1

16 b) Consider $\Delta\, RLQ \;\; and \;\; \Delta PLN$

$\angle RLQ = \angle PLN$ (V.O.A) ∠RQL=∠PNL (Alternate angles)

$\Rightarrow \Delta\, RLQ \sim \Delta PLN$ (AA rule)

$\Rightarrow \frac{RL}{PL} = \frac{LQ}{LN} = \frac{RQ}{PN} \Rightarrow \frac{2}{3} = \frac{LQ}{LN} = \frac{10}{PN}$ ⇒ PN=15 cm.

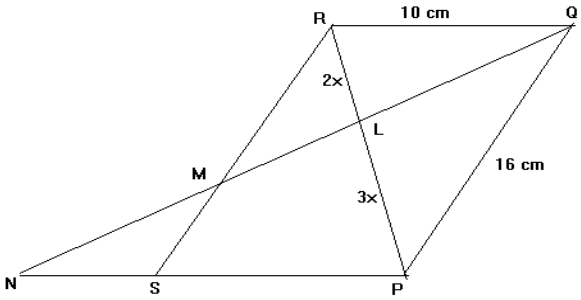
Consider $\Delta RLM \text{ and } \Delta PLQ$

$\angle RLM = \angle QLP \qquad (V.O.A)$

∠LRM=∠LPQ (Alternate angle)

$\Rightarrow \Delta RLM \sim \Delta PLQ \quad (AA \text{ rule})$

$\Rightarrow \frac{RL}{PL} = \frac{LM}{LQ} = \frac{RM}{PQ} \Rightarrow \frac{2}{3} = \frac{LM}{LQ} = \frac{RM}{16} \Rightarrow RM = \frac{32}{3}\ cm.$



17.

Consider$\Delta CHN \text{ and } \Delta BHM$

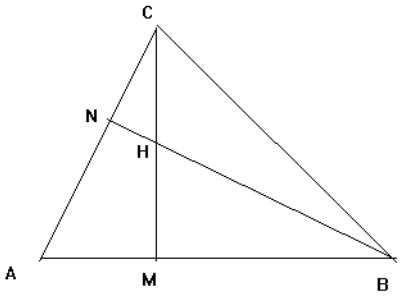
∠CHN=∠BHM (V.O.A)

∠HNC=∠HMB=90

$\Rightarrow \Delta CHN \sim \Delta BHM \quad (AA)$

$\Rightarrow \frac{CH}{BH} = \frac{CN}{BM} = \frac{HN}{HM}$ ----------(1)

⇒ CN.HM=BM.HN ans.



By equivalent ratio property , $\left(\frac{CH}{BH}\right)^2 = \frac{CN}{BM} \times \frac{HN}{HM}$ from (1)

$\Rightarrow \frac{CH}{BH} = \sqrt{\frac{CN}{BM} \times \frac{HN}{HM}}$ ans.

From (1) we have $\frac{CH}{BH} = \frac{HN}{HM}$

∠MHN=∠BHC (V.O.A)

$\Rightarrow \Delta MHN \sim \Delta BHC \quad (SAS)$ ans.

20. b) Consider $\Delta AEF \ , \Delta DEC$

∠AEF=∠DEC (V.O.A)

∠AFE=∠DCE (Alternate angle)

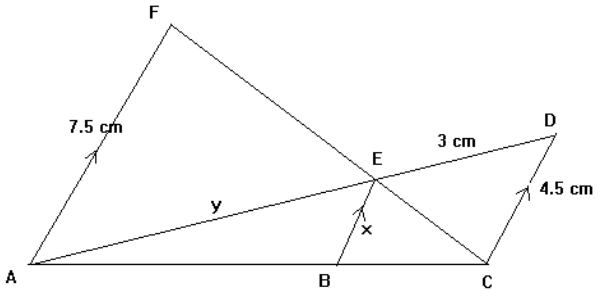
$\Rightarrow \Delta AEF \sim \Delta DEC \quad (AA)$

$\Rightarrow \frac{AE}{DE} = \frac{AF}{DC} = \frac{EF}{EC}$

$\Rightarrow \frac{y}{3} = \frac{7.5}{4.5}$

⇒y=5 cm. ans.

Consider $\Delta ABE \ , \ \Delta ACD$



∠BAE=∠CAD (Common)

∠ABE=∠ACD (Corresponding angle)

$\Rightarrow \Delta ABE \sim \Delta ACD \ \ (AA)$

$\Rightarrow \frac{AB}{AC} = \frac{AE}{AD} = \frac{BE}{CD}$

$\Rightarrow \frac{y}{y+3} = \frac{x}{4.5} \quad \Rightarrow x = 2.8125\ cm$ ans.

HOME WORK : Rest of the questions from the exercise.