TRIANGLES
PPT-6

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 06
CHAPTER NAME :TRIANGLES

PREVIOUS KNOWLEDGE TEST

Two triangles are similar if either of the following three criterion's are satisfied:

1.AAA similarity Criterion. If two triangles are equiangular, then they are similar.

2.Corollary(AA similarity). If two angles of one triangle are respectively equal to two angles of another triangle, then the two triangles are similar.

3.SSS Similarity Criterion. If the corresponding sides of two triangles are proportional, then they are similar.

3.SAS Similarity Criterion. If in two triangles, one pair of corresponding sides are proportional and the included angles are equal, then the two triangles are similar.

- **Results in Similar Triangles based on Similarity Criterion:**

1.Ratio of corresponding sides = Ratio of corresponding perimeters

2.Ratio of corresponding sides = Ratio of corresponding medians

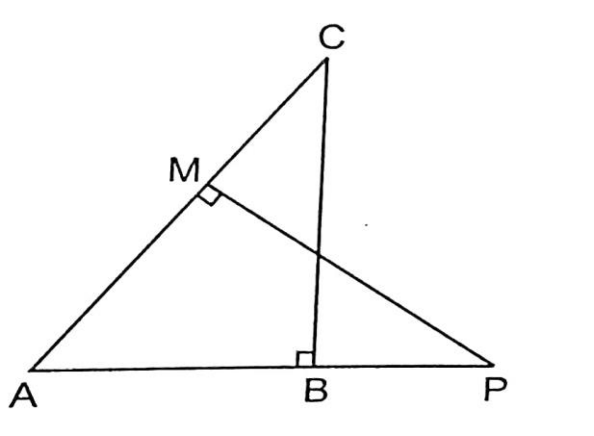
3.Ratio of corresponding sides = Ratio of corresponding altitudes

4.Ratio of corresponding sides = Ratio of corresponding angle bisector segments

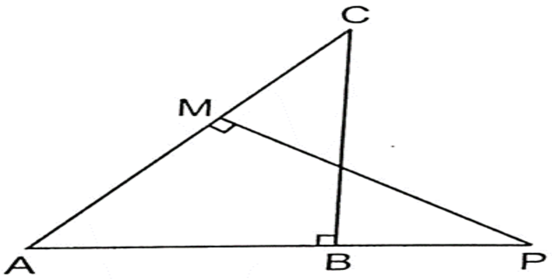
LEARNING OUTCOME

1. Students will be able to know the Criteria for similarity of triangles. (AAA, SSS, & SAS)
2. Students will be able to prove problems involving AAA, SSS, & SAS similarity criteria.
3. Students will be able to solve problems based on similarity of triangles.

1.In Fig. ABC and AMP are two right triangles, right angled at B and M respectively. Prove that: (i) $\Delta ABC \sim \Delta AMP$ (ii) $CA/PA = BC/MP$



1.In Fig. ABC and AMP are two right triangles, right angled at B and M respectively. Prove that: (i) ΔABC ~ ΔAMP (ii) CA/PA = BC/MP



Sol. (i) In ΔABC and ΔAMP,

$\angle B = \angle AMP$ [Each 90°]

$\angle A = \angle A$ [Common]

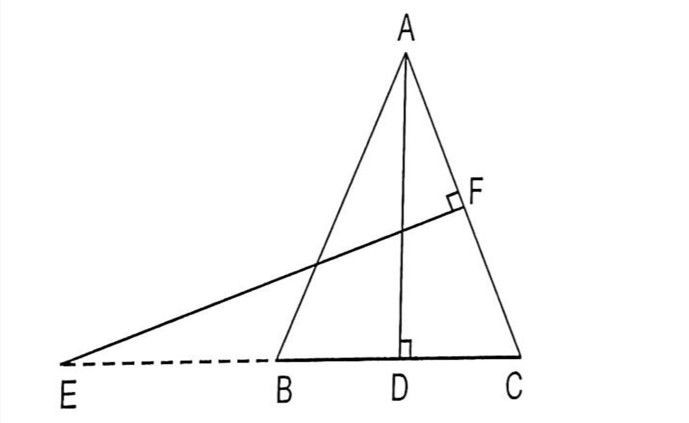
$\Rightarrow \Delta ABC \sim \Delta AMP$ [AA]

(ii) $\Delta ABC \sim \Delta AMP$ [proved above]

$$\Rightarrow \frac{CA}{PA} = \frac{CB}{PM}$$

[Ratio of the Corresponding sides of similar Δs]

2.In Fig. E is a point on side CB produced of an isosceles triangle ABC with AB = AC. If AD ⊥ BC and EF ⊥AC, prove that Δ ABD ~ Δ ECF..



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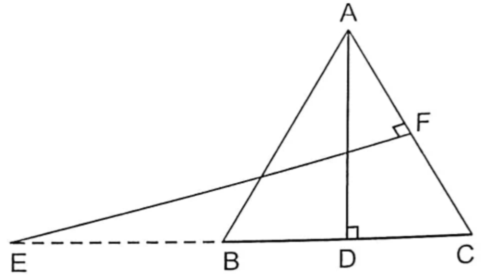

Sol. In ΔABD and ΔECF,

$\angle ADB = \angle EFC$ [Each 90°]

$\angle B = \angle C$

[angles opposite to equal sides are equal]

$\Rightarrow$ $\Delta ABD \sim \Delta ECF$ [AA]

3. Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of Δ PQR. Show that Δ ABC ~ Δ PQR.

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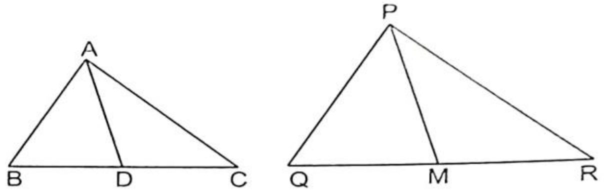


Sol. In ΔABC and ΔPQR,

$$\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AD}{PM} \quad \text{[Given]}$$

or $$\frac{AB}{PQ} = \frac{\frac{1}{2}BC}{\frac{1}{2}QR} = \frac{AD}{PM}$$

$\Rightarrow$ $$\frac{AB}{PQ} = \frac{BD}{QM} = \frac{AD}{PM}$$

$\Rightarrow$ $\Delta ABD \sim \Delta PQM$ [SAS]

$\therefore$ $\angle B = \angle Q$

[Corresponding angles of similar triangles]

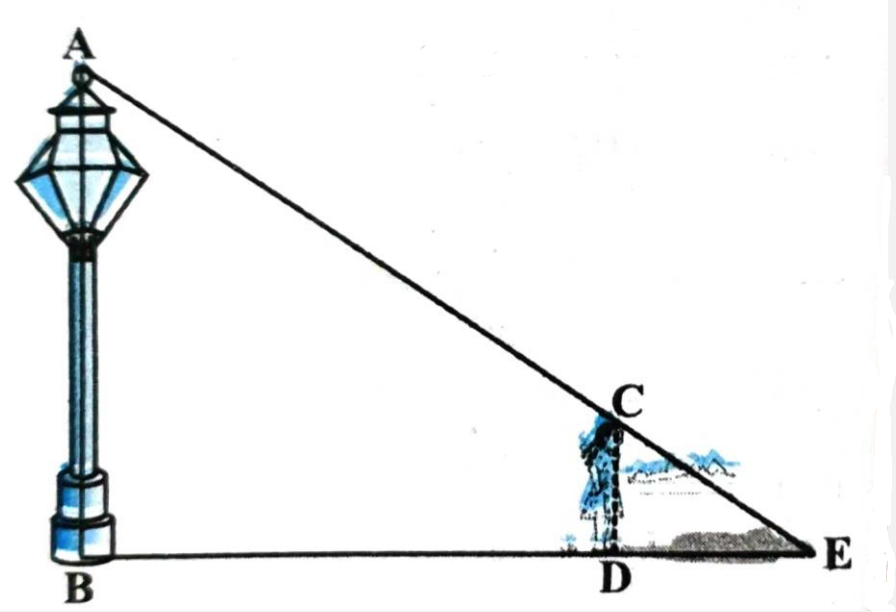
In ΔABC and ΔPQR,

$$\frac{AB}{PQ} = \frac{BC}{QR} \quad \text{[Given]}$$

$\angle B = \angle Q$ [As proved]

$\therefore$ $\Delta ABC \sim \Delta PQR$ [SAS]

4. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.



4. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

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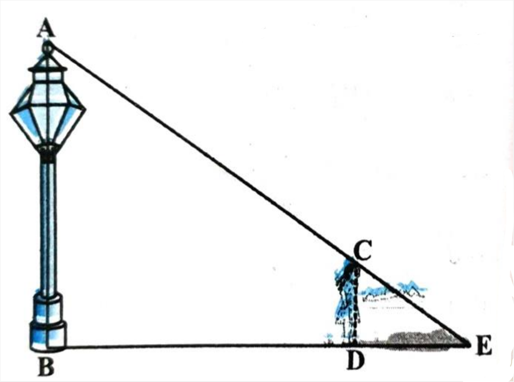
Let Δ AB denote the lamp-post and CD the girl after walking for 4 seconds away from the lamp-post . From the figure, DE is the shadow of the girl. Let DE be x meters.

Now, BD = 1.2 m x 4 = 4.8 m. in Δ ABE and Δ CDE,

∠ B = ∠ D (Each is of 90° because lamp-post as well as the girl are standing vertical to the ground) and ∠ E = ∠ E (Same angle)



So, Δ ABE ~ Δ CDE (AA similarity criterion)

Therefore, BE/DE = AB/CD

i.e., (4.8 + x)/ x = 3.6 /0.9 (90 cm = 0.9 m)

i.e., 4.8 + x = 4x

i.e., 3x = 4.8

i.e., x = 1.6 So, the shadow of the girl after walking for 4 seconds is 1.6 m long

HOME ASSIGNMENT Ex. 6.3 Q. No 9 to Q12

AHA

1. If the bisector of an angle bisects the opposite side, prove that the triangle is isosceles.
2. If a line through one vertex of a triangle divides the opposite sides in the ratio of other two sides, then the line bisects the angle at the vertex.

THANKING YOU

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