TRIANGLES
PPT-5

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 06
CHAPTER NAME :TRIANGLES

CHANGING YOUR TOMORROW

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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.

4.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.

LEARNING OUTCOME

11.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.

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1.Diagonals AC and BD of a trapezium ABCD with AB || DC intersect each other at the point O. Using a similarity criterion for two triangles, show that OA /OC = OB /OD

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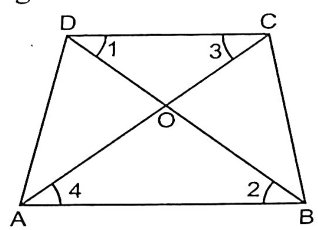
Sol. Given: Diagonals AC and BD intersect at O.



AB || DC

To Prove: $\frac{OA}{OC} = \frac{OB}{OD}$

Proof: In ΔAOB and ΔCOD

$\angle 1 = \angle 2$

$\angle 3 = \angle 4$ [Alternate angles]

$\therefore$ $\Delta AOB \sim \Delta COD$ [AA]

$\Rightarrow$ $\frac{OA}{OC} = \frac{OB}{OD}$

[Corresponding sides of similar triangles]

2. S and T are points on sides PR and QR of Δ PQR such that ∠ P = ∠ RTS. Show that Δ RPQ ~ Δ RTS.

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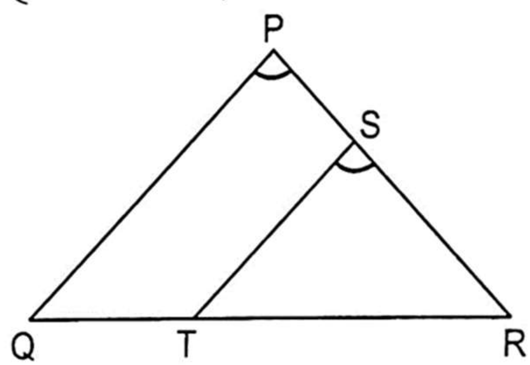
Sol. In ΔRPQ and ΔRTS,

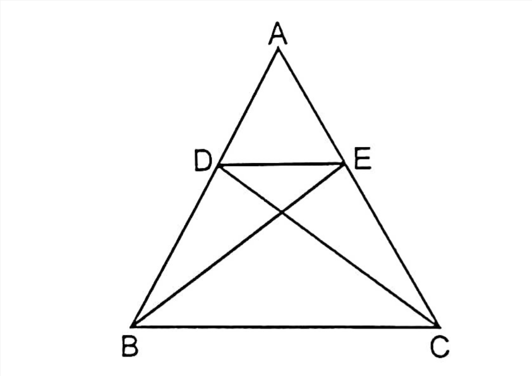


$\angle P = \angle RTS$ [Given]

$\angle R = \angle R$ [Common]

$\therefore$ $\Delta RPQ \sim \Delta RTS$ [AA]

3. if Δ ABE $\cong$ Δ ACD, show that Δ ADE ~ Δ ABC.



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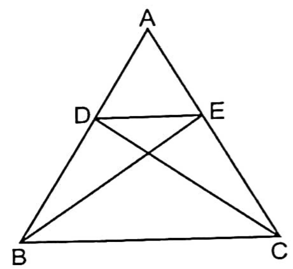


Sol. Given: $\Delta ABE \cong \Delta ACD$

To Prove: $\Delta ADE \sim \Delta ABC$

Proof: $\Delta ABE \cong \Delta ACD$

$AB = AC$ and $AE = AD$

$\Rightarrow \quad \frac{BA}{AC} = 1, \frac{AD}{AE} = 1$

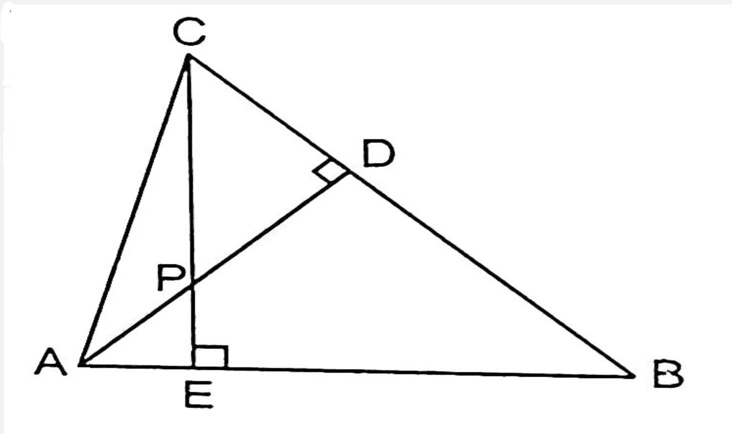
In ΔADE and ΔABC,

$\frac{AD}{AE} = \frac{AB}{AC}$ [Proved above]

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

$\therefore \quad \Delta ADE \sim \Delta ABC$ [SAS]

4. In Fig. altitudes AD and CE of Δ ABC intersect each other at the point P. Show that: (i) ΔAEP ~ Δ CDP (ii) ΔABD ~ Δ CBE (iii) ΔAEP ~ ΔADB (iv) Δ PDC ~ Δ BEC



4. In Fig. altitudes AD and CE of Δ ABC intersect each other at the point P. Show that: (i) ΔAEP ~ Δ CDP (ii) ΔABD ~ Δ CBE (iii) ΔAEP ~ ΔADB (iv) Δ PDC ~ Δ BEC

Sol. Given: AD and CE are altitudes of the ΔABC

(*i*) **To Prove:** ΔAEP ~ ΔCDP

Proof: In ΔAEP and ΔCDP,

∠AEP = ∠CDP [Each 90°]

∠APE = ∠CPD [Vertically opposite angles]

ΔAEP ~ ΔCDP [AA]

(*ii*) In ΔABD and ΔCBE,

∠ADB = ∠CEB [Each 90°]

∠ABD = ∠CBE [Common]

ΔABD ~ ΔCBE [AA]

(*iii*) In Δ AEP and ΔADB,

∠AEP = ∠ADB [Each 90°]

∠A = ∠A [Common]

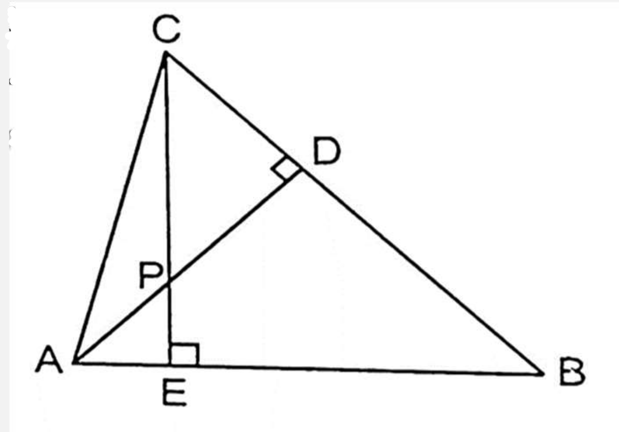
∴ ΔAEP~ ΔADB [AA]

(*iv*) In ΔPDC and ΔBEC,

∠PDC = ∠BEC [Each 90°]

∠PCD = ∠BCE [Common]

ΔPDC ~ ΔBEC [AA]



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5.E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that Δ ABE ~ Δ CFB. .

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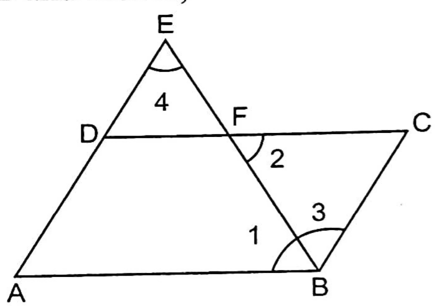
Sol. In ΔABE and ΔCFB,



$\angle 1 = \angle 2$

$\angle 4 = \angle 3$ [Alternate angles]

$\Rightarrow$ $\Delta ABE \sim \Delta CFB$ [AA]

HOME ASSIGNMENT Ex 6.3 Q 3 to Q 8

AHA

1. 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.

2. If PS is the bisector of ∠ QPR of Δ PQR. Prove that QS/ PQ =SR /PR ·.

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THANKING YOU

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