MATHS

BOOKS - NAND LAL PUBLICATION

TRIANGLES

Exercise 6 1

1. Give two different examples of pair of ,- similar figures.

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2. Give two different examples of pair of ,- non-similar figures.

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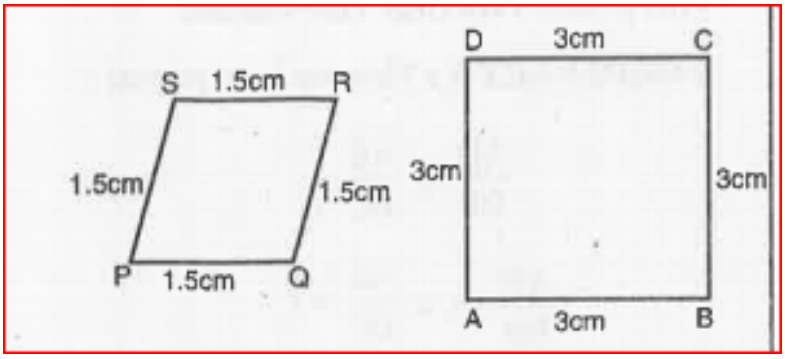
3. State whether the following quadrilaterals are similar or not :-



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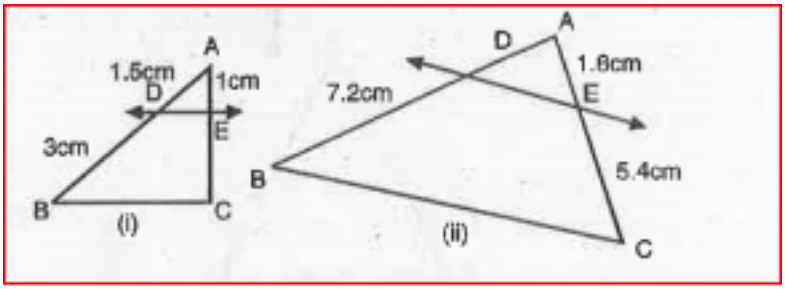
Exercise 6 2

1. In fig. (i) and (ii), DE || BC. Find EC in (i) and AD in (ii).



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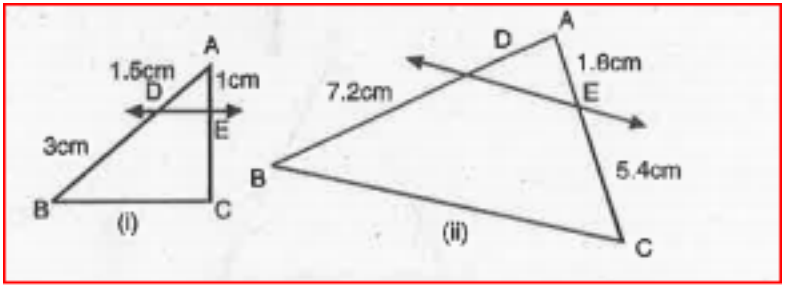
2. In fig. (i) and (ii), DE || BC. Find EC in (i) and AD in (ii).



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3. E and F are points on the sides PQ and PR respectively of a $\angle PQR$. For each of the following cases, state whether EF || OR : PE = 3.9 cm, EQ = 3 cm, PF = 3.6 cm and FR = 2.4 cm.

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4. E and F are points on the sides PQ and PF respecively of a ΔPQR. For each of the following series, state whether EF|| QR:

$PE = 4cm, QE = 4.5cm, PF = 8cm$ and $RE = 9$

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5. E and F are points on the sides PQ and PR respectively of a $\angle PQR$. For each of the

following cases, state whether EF || QR : PQ = 1.28 cm, PR = 2.56 cm, PE = 0.18 cm and PF = 0.36 cm.

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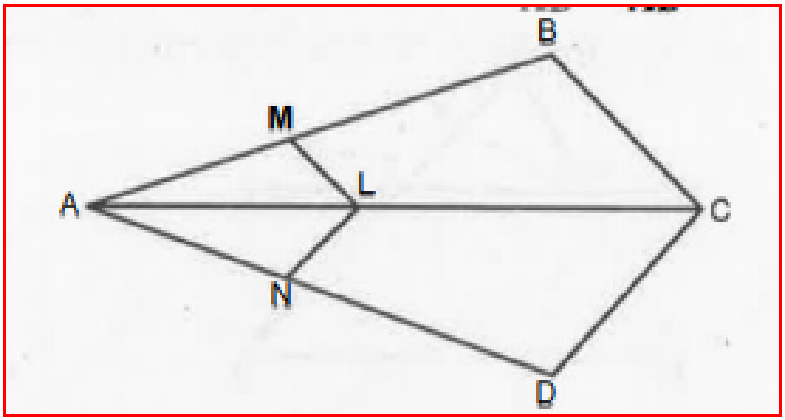
6. In fig., LM || CB , and LN||CD.Prove that $\frac{AM}{AB} = \frac{AN}{AD}$.



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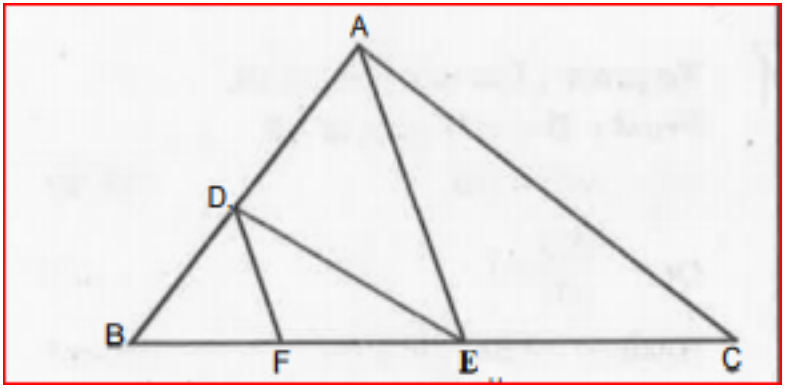
7. In fig. DE || AC, and DF || AE prove that $\frac{BF}{EF} = \frac{BE}{EC}$.



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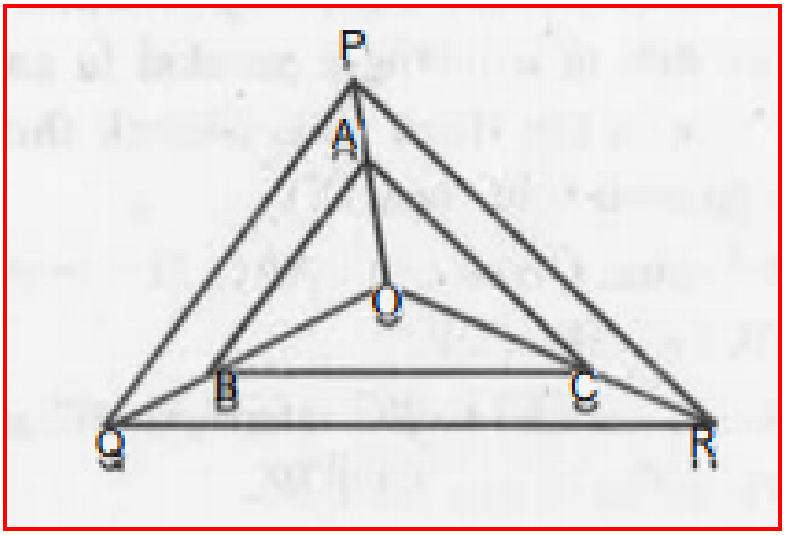
8. In fig., A, B and C are points on OP, OQ and OR respectively such that AB || PQ and AC || PR. Show

that BC || QR.



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9. ABCD is a trapezium in which AB II DC and its diagonals intersect each other at the point O. show that $\frac{AO}{BO} = \frac{CO}{DO}$.

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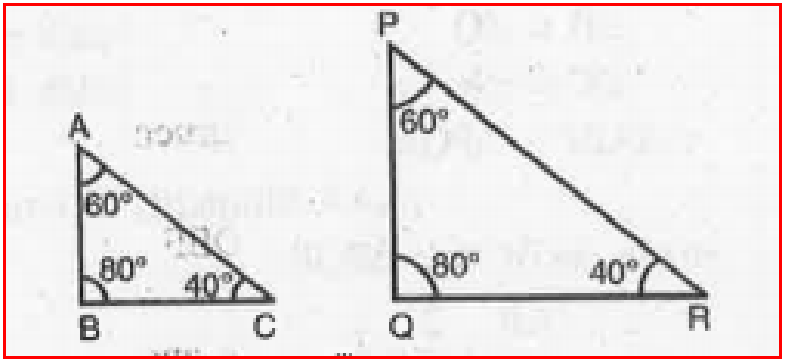
Exercise 6 3

1. State which pairs of triangles in Fig. are similar. Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form :



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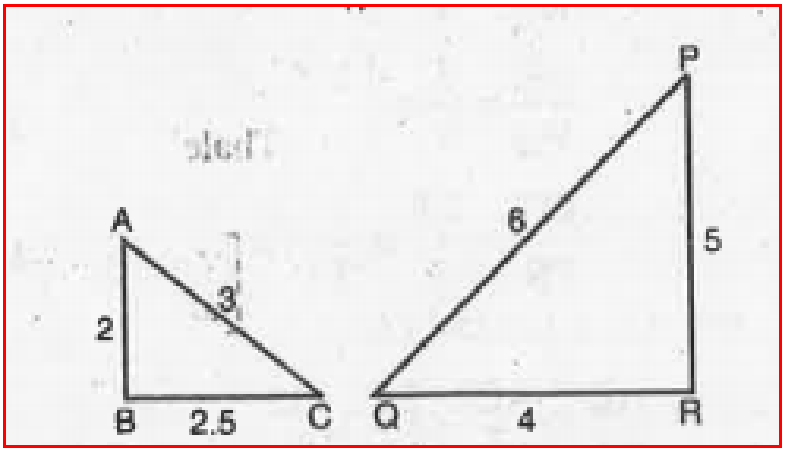
2. State which pairs of triangles in Fig. are similar. Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form :



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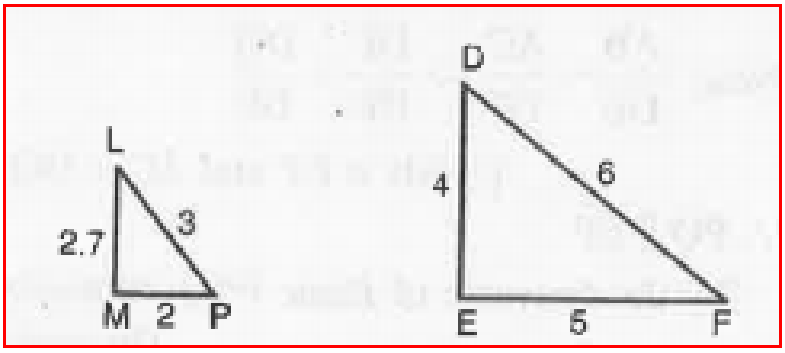
3. State which pairs of triangles in Fig. are similar. Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form :



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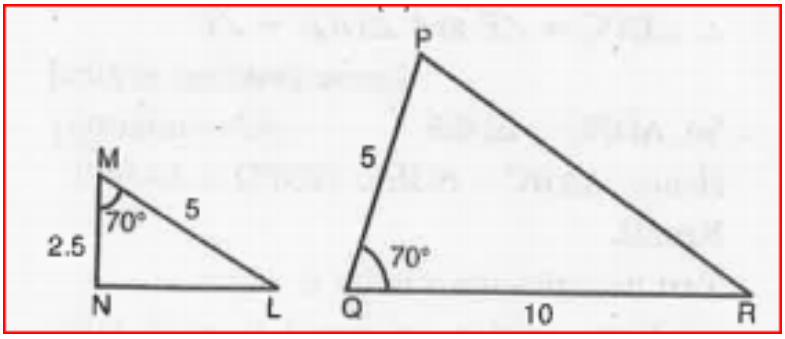
4. State which pairs of triangles in Fig. are similar. Write the similarity criterion used by you for

answering the question and also write the pairs of similar triangles in the symbolic form :



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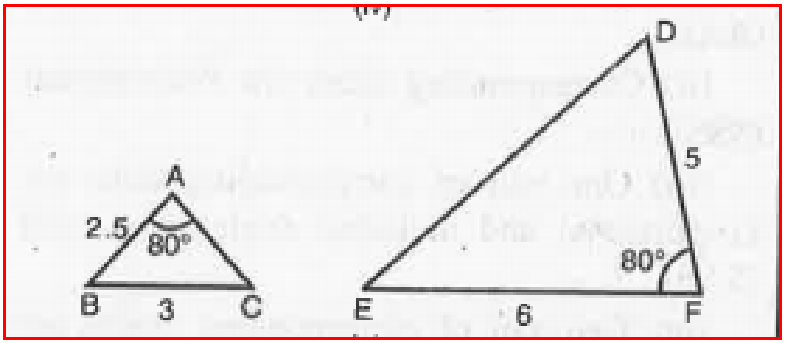
5. State which pairs of triangles in Fig. are similar. Write the similarity criterion used by you for answering the question and also write the pairs

of similar triangles in the symbolic form :



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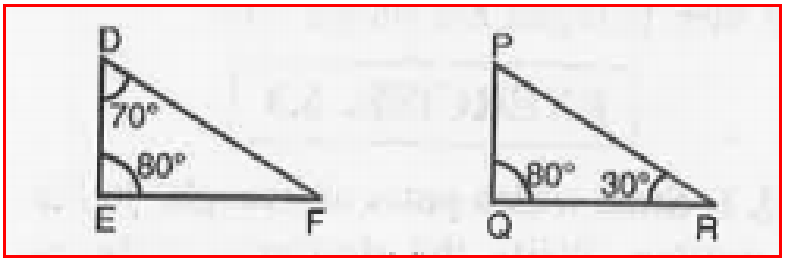
6. State which pairs of triangles in Fig. are similar. Write the similarity criterion used by you for answering the question and also write the pairs

of similar triangles in the symbolic form :



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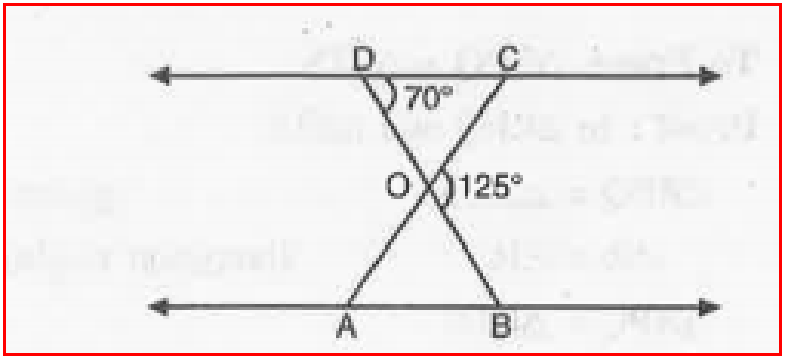
7. In fig., $\triangle ODC - \triangle OBA, \angle BOC = 125 \circ 0$ and $\angle CDO = 70 \circ 0$. Find $\angle DOC$, $\angle DCO$ and $\angle OAB$.



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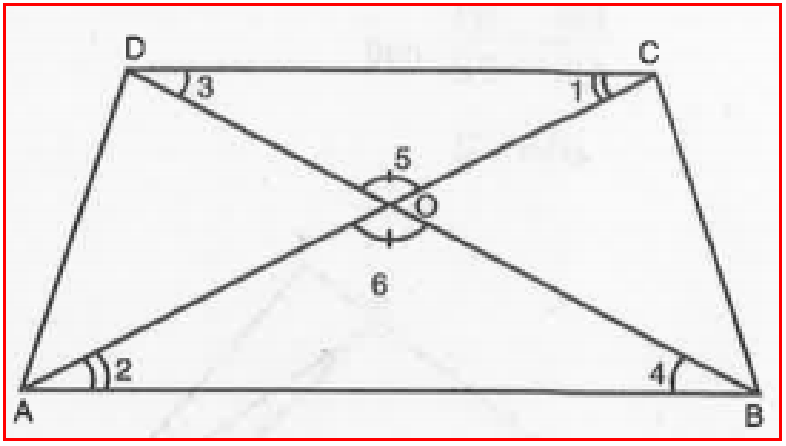
8. Diagonals AC and BD of a trapezium ABCD with AB || DC intersect each other at the point O. Using a similarity criterion for two triangles , show that $\frac{OA}{OC} = \frac{OB}{OD}$.



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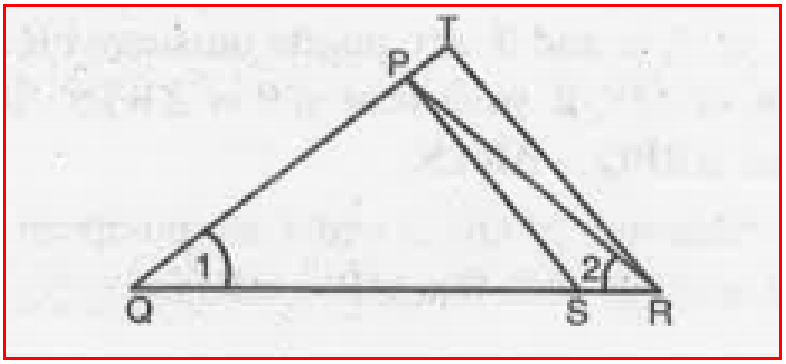
9. In fig., $\frac{QR}{QS} = \frac{QT}{PR}$ and $\angle 1 = \angle 2$. Show that $\triangle PQS \sim \triangle TQR$.



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10. D is a point on side BC of ΔABC such that AD = AC (see Fig. 7.47). Show that AB > AD.

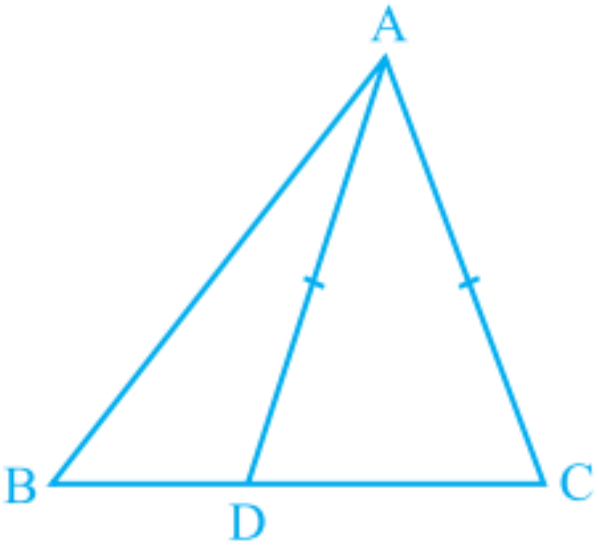

Fig. 7.47

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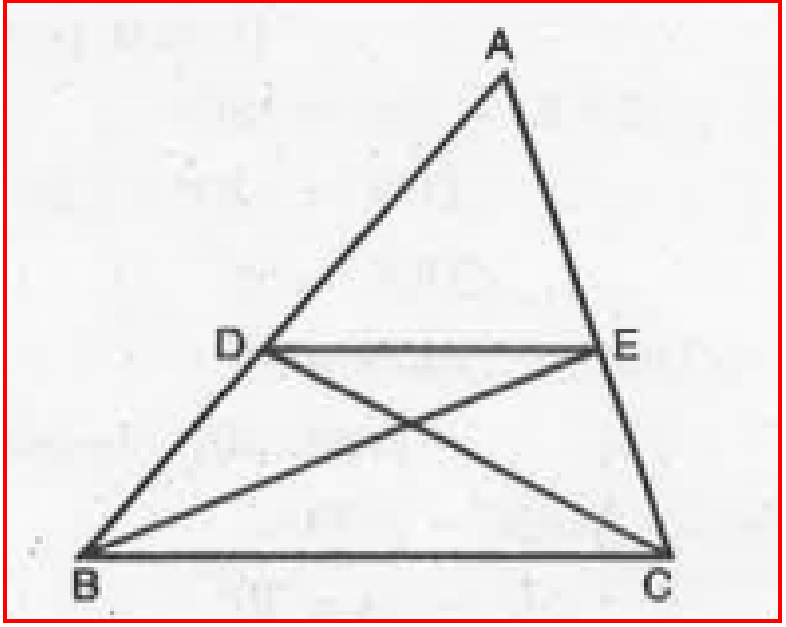
11. In figure $\triangle ABE = \triangle ACD$ show that $\triangle ADE \sim \triangle ABC$.



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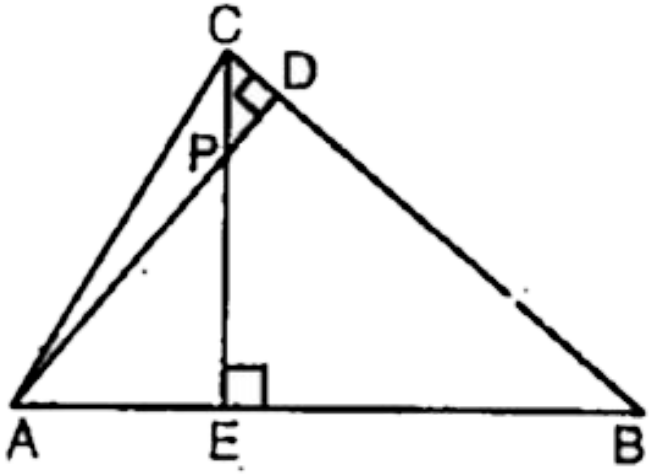
12. In figure, altitudes AD and CE of ΔABC intersect each ther at the point P. show that:



$\Delta AEP \sim \Delta CDP$

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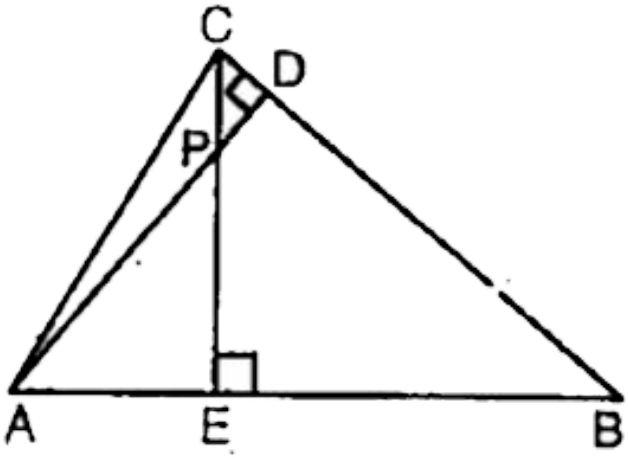
13. In figure, altitudes AD and CE of ΔABC intersect each ther at the point P. show that:



$\Delta ABD \sim \Delta CBE$

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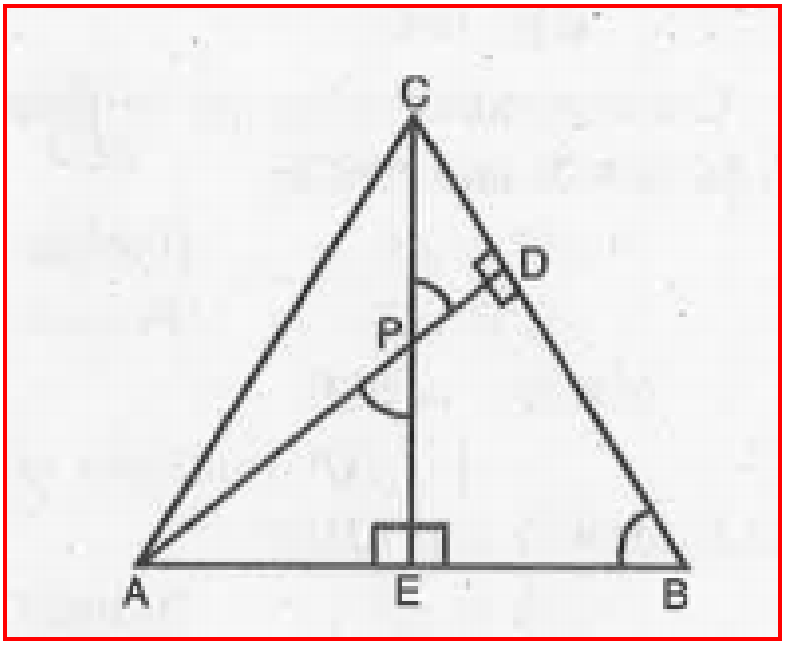
14. In Fig., altitudes AD and CE of $\triangle ABC$ intersect each other at the point P. Show that :-

$\triangle AEP \sim \triangle ADB$.



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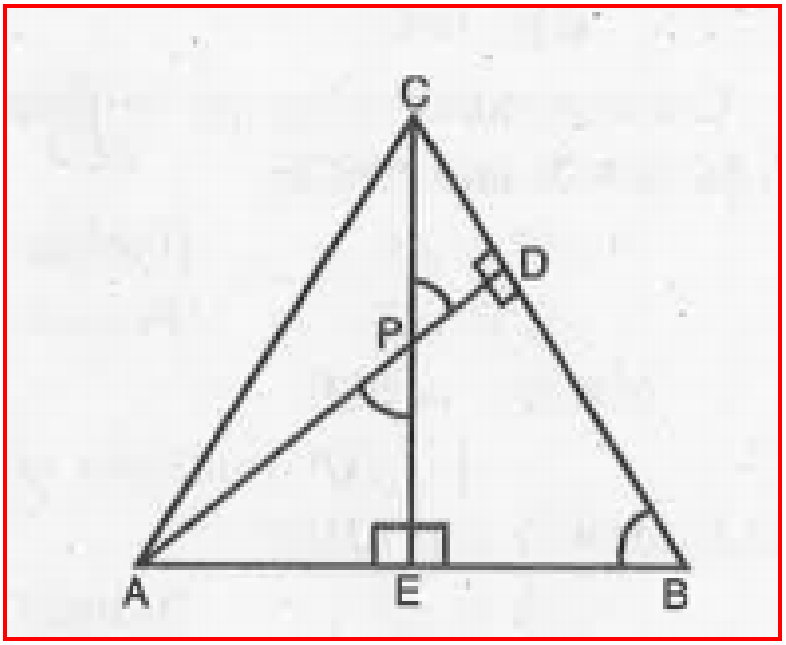
15. In Fig., altitudes AD and CE of $\triangle ABC$ intersect each other at the point P. Show that :-

$\triangle PDC \sim \triangle BEC$.



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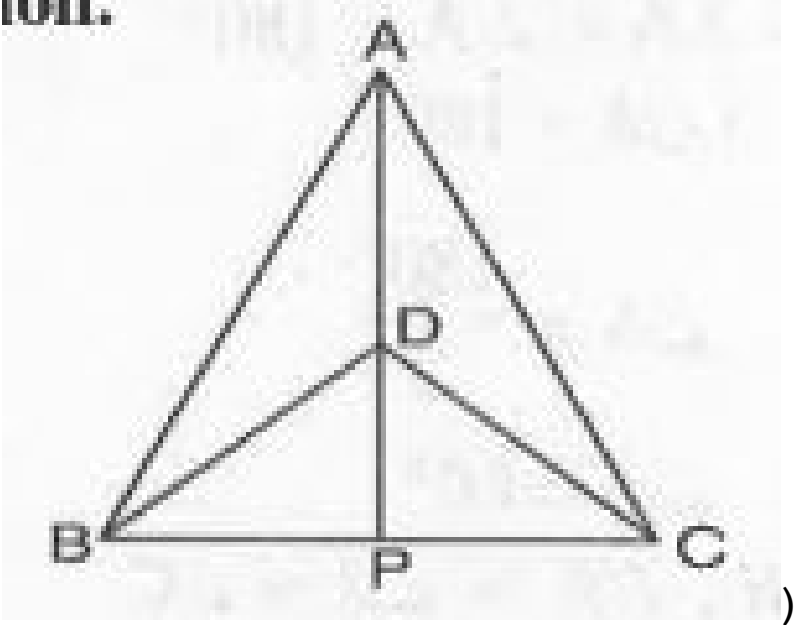
16. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (See Fig.



).If AD is extended to intersect BC at P, show that $\Delta ABP \cong \Delta ACP.$

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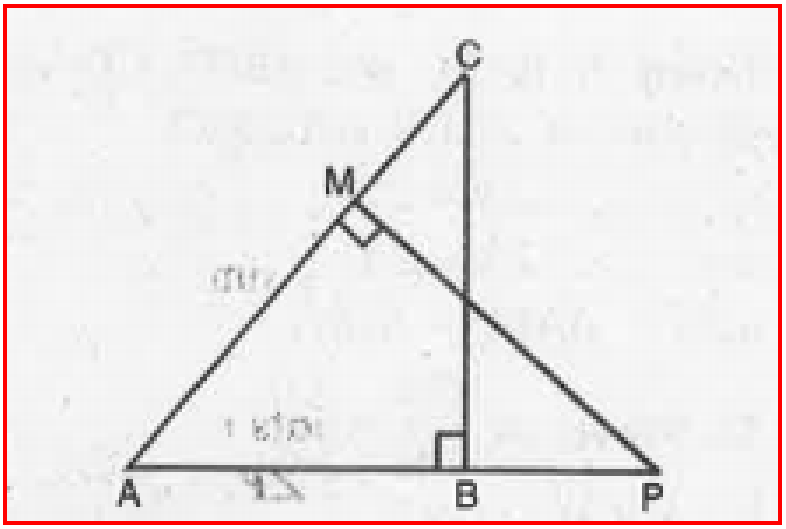
17. In Fig., ABC and AMP are two right triangles, right angled at B and M respectively. Prove that :-

$\triangle ABC \sim \triangle AMP$.



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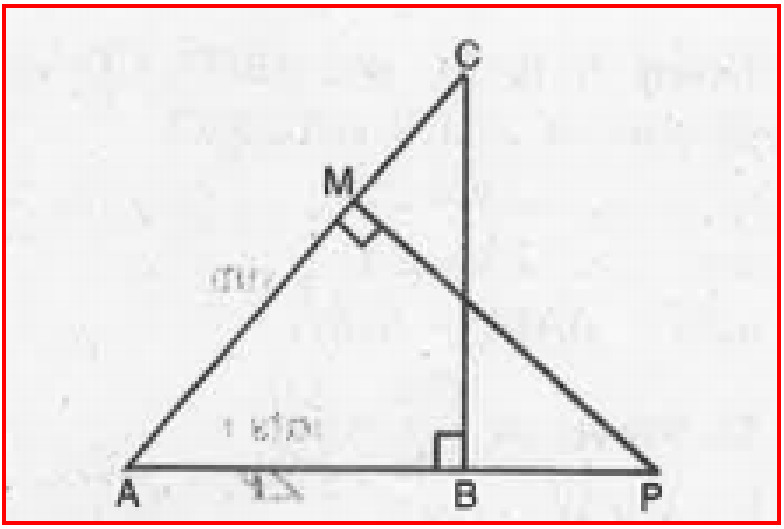
18. In Fig., ABC and AMP are two right triangles, right angled at B and M respectively. Prove that :-

$\frac{CA}{PA} = \frac{BC}{MP}$.



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19. CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides AB and FE of $\triangle ABC$ and $\triangle EFG$ respectively. If $\triangle ABC \sim \triangle FEG$, show that :- $\frac{CD}{GH} = \frac{AC}{FG}$.

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20. CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides AB and FE of $\triangle ABC$ and $\triangle EFG$ respectively. If $\triangle ABC \sim \triangle FEG$, show that :- $\triangle DCB \sim \triangle HGE$.

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21. CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides

AB and FE of $\triangle ABC$ and $\triangle EFG$ respectively. If $\triangle ABC \sim \triangle FEG$, show that :- $\triangle DCB \sim \triangle HGE$.

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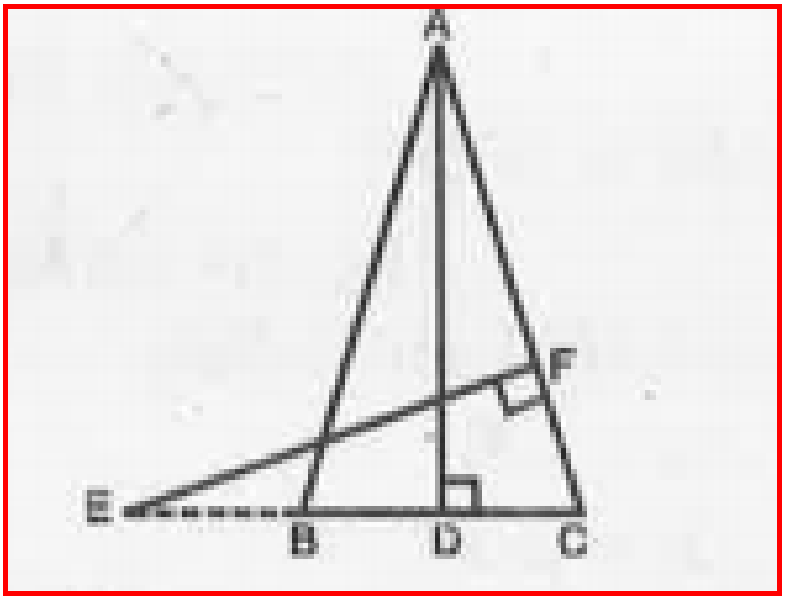
22. In Fig., E is a point on side CB produced of an isosceles triangle ABC with AB = AC. If AD $\perp$ BC

and EF $\perp$ AC, prove that $\triangle ABD \sim \triangle ECF$.



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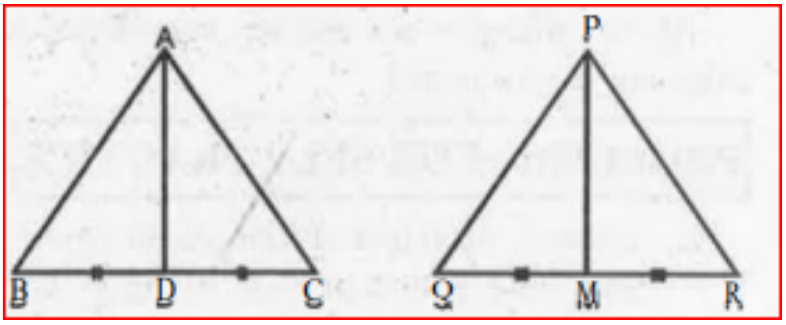
23. If AD and PM are medians of triangles ABC and PQR, respectively where $\triangle ABC \sim \triangle PQR$,

Prove that $\frac{AB}{PQ} = \frac{AD}{PM}$.



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Exercise 6 4

1. Let $\Delta ABC \sim \Delta DEF$ and their areas be, respectively, 64 cm^2 and 121 cm^2. If EF = 15.4 cm, find BC.

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2. Diagonals of a trapezium ABCD with AB||DC intersect each other at the point O. If AB=2 CD,find the ratio of the areas of triangles AOB and COD.

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3. If the areas of two similar triangles are equal, prove that they are congruent.

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4. If D,E and F are respectively, the mid-points of AB,AC and BC in ΔABC, then BE+AF is equal to

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5. Prove that the areas of the equilateral triangle described on the side of a square is equal to half the area of the equilateral triangle described on one of its diagonal.

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6. If ABC and BDE are two equilateral triangles such that D is the mid-point of BC, then find $ar(\triangle ABC) : ar(\triangle BDE)$

A. $2:1$

B. $1:2$

C. $4:1$

D. $1:4$

Answer: C

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7. Tick the correct answer and justify : Sides of two similar triangles are in the ratio 4:9. Areas of these triangles are in the ratio

A. $2:3$

B. $4:9$

C. $81:16$

D. $16:81$

Answer: D

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Exercise 6 5

1. Sides of triangles are given below. Determine which of them are right triangles. In case of a right triangle, write the length of its hypotenuse.

:- 7 cm, 24 cm, 25 cm

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2. Sides of triangles are given below. Determine which of them are right triangles. In case of a

right triangle, write the length of its hypotenuse.

:- 3 cm, 8 cm, 6 cm.

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3. Sides of triangles are given below. Determine which of them are right triangles. In case of a right triangle, write the length of its hypotenuse.

:- 50 cm, 80 cm, 100 cm.

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4. Sides of triangles are given below. Determine which of them are right triangles. In case of a right triangle, write the length of its hypotenuse.

:- 13 cm, 12 cm, 5 cm.

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5. PQR is a triangle right angled at P and M is a point on QR such that PM $\perp$ QR. Show that PM^2 = QM.MR.

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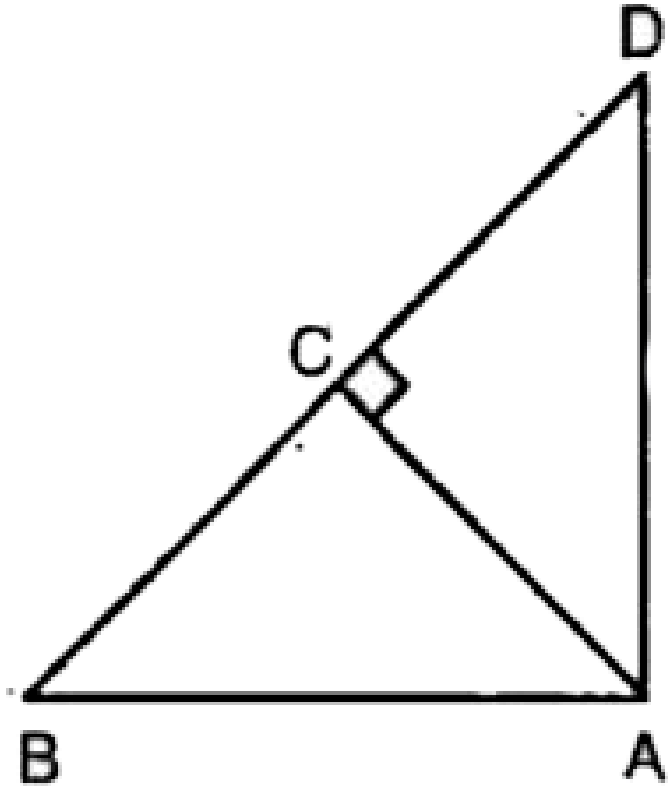
6. In ABD is a triangle right angled at A and $AC \perp BD$. Show right angled at A and $AC \perp BD$. Show that



$AB^2 = BC.BD$

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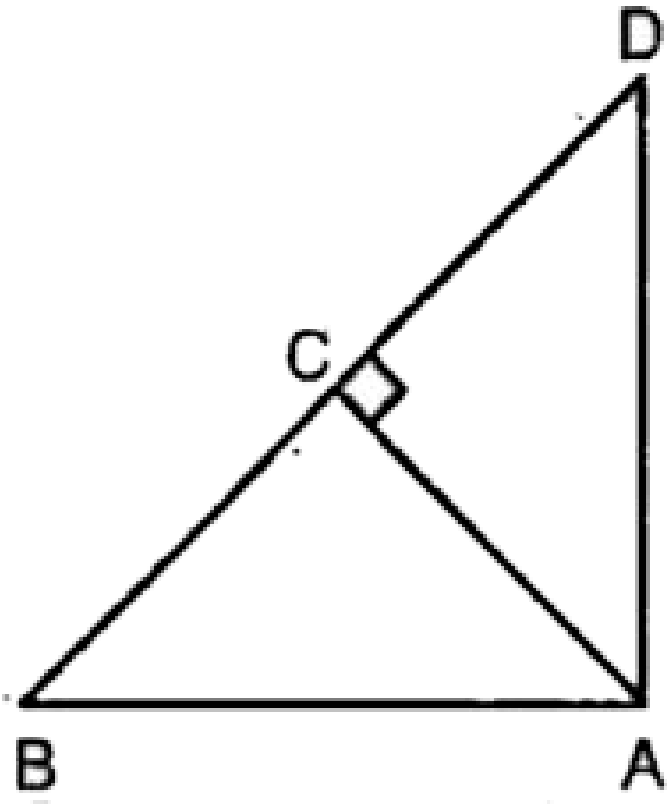

$AC^2 = BC.DC$

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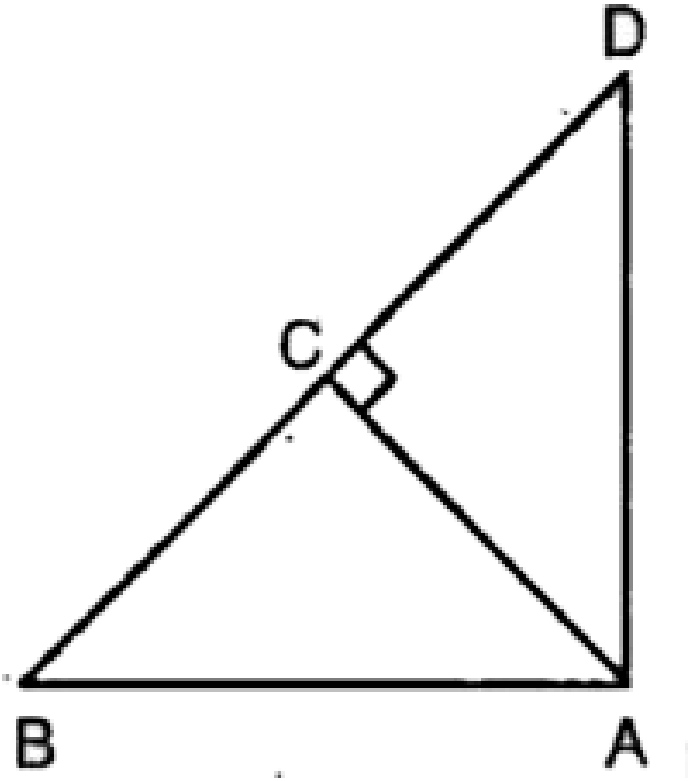
8. In ABD is a triangle right angled at A and $AC \perp BD$. Show right angled at A and $AC \perp BD$. Show that



$AD^2 = BD.CD$

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9. ABC is an isosceles triangle right angled at C. Prove that $AB^2 = 2AC^2$.

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10. ABC is an isosceles triangle with AC = BC. If $AB^2 = 2AC^2$, prove that ABC is right triangle.

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11. ABC is an equilateral triangle ofside 2a. Find each of its altitudes.

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12. A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from base of the wall.

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13. D and E are points on the sides CA and CB respectively of a triangle ABC right angled at C. Prove that $AE^2 + BD^2 = AB^2 + DE^2$.

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14. In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.

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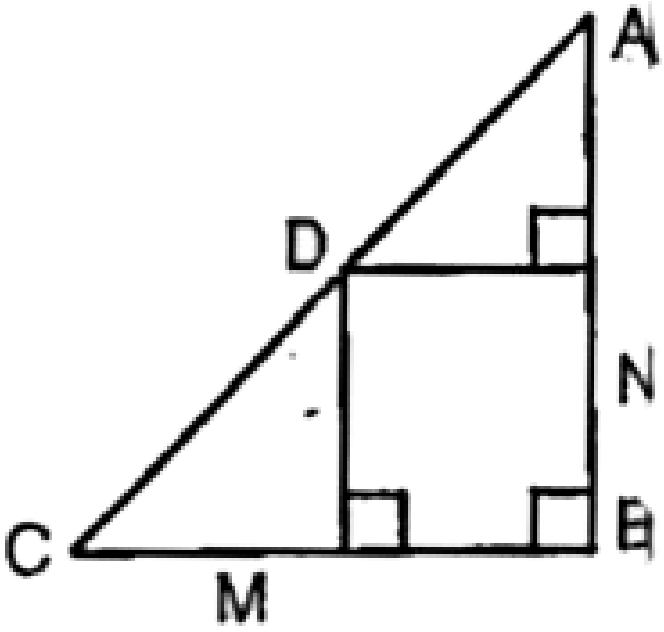
Exercise 6 6

1. In figure , D is point on hypotenuse AC of $\Delta ABC, BD \perp AC, DM \perp BC$ and $DN \perp AB$.

Prove that



$DM^2 = DN.MC$

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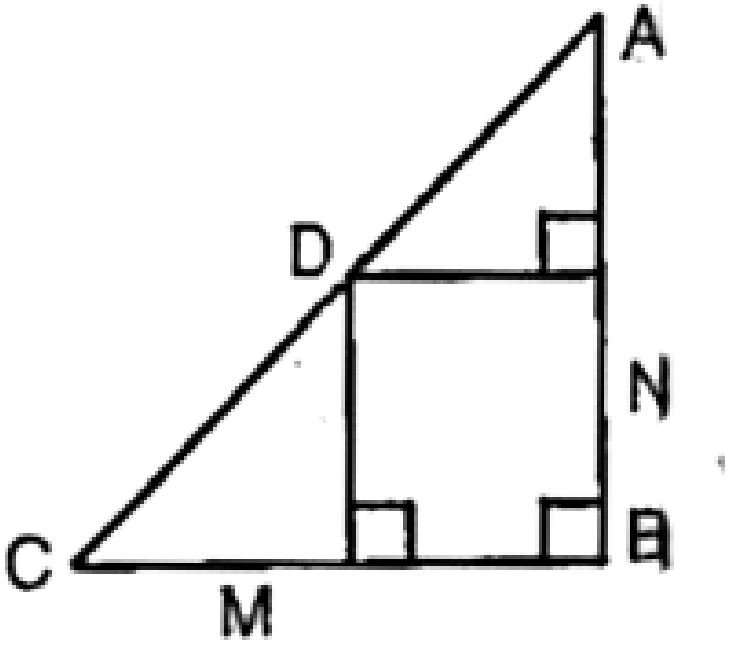
2. In figure , D is point on hypotenuse AC of $\Delta ABC, BD \perp AC, DM \perp BC$ and $DN \perp AB.$

Prove that



$DN^2 = DM.\ AN$

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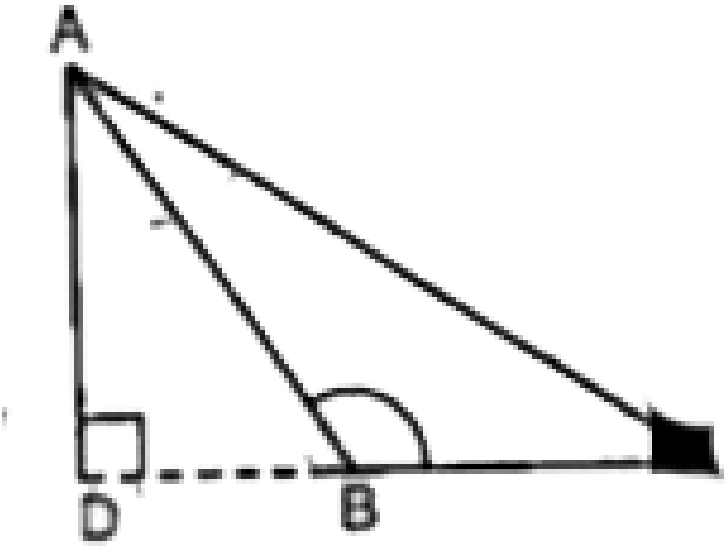
3. In figure, ABC is a triangle in which $\angle ABC > 90^\circ$ and $AD \perp CB$ produced. Prove that $AC^2 = AB^2 + BC^2 + 2BCBD$.



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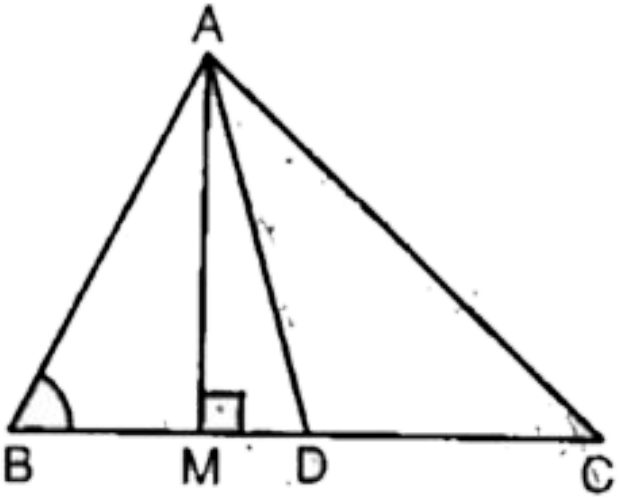
4. In figure, AD is a median of a triangle ABC and $AM \perp BC$. Prove that



$$AC^2 = AD^2 + BC.DM + \left(\frac{BC}{2}\right)^2$$

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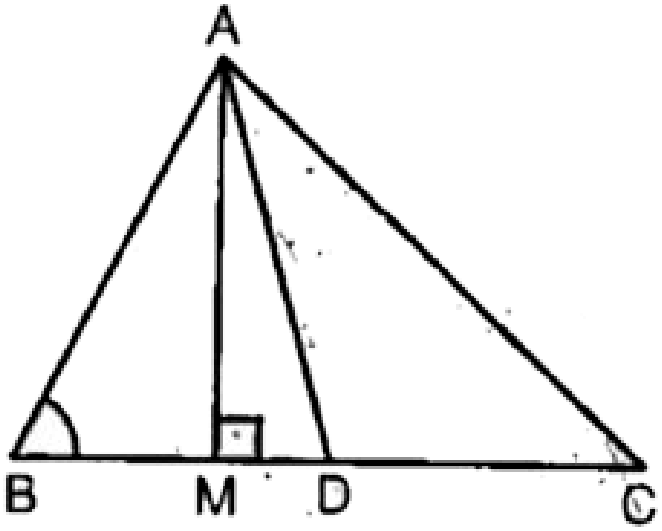
5. In figure, AD is a median of a triangle ABC and $AM \perp BC$. Prove that



$$AB^2 = AD^2 - BC.DM + \left(\frac{BC}{2}\right)^2$$

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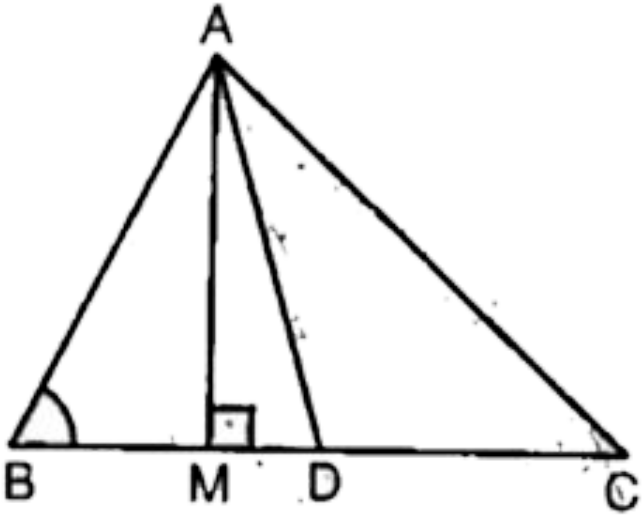
6. In figure, AD is a median of a triangle ABC and $AM \perp BC$. Prove that



$$AC^2 + AB^2 = 2AD^2 + \frac{1}{2}BC^2.$$

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7. Prove that sum of squares of the diagonals of a parallelogram is equal to sum of squares of its sides.

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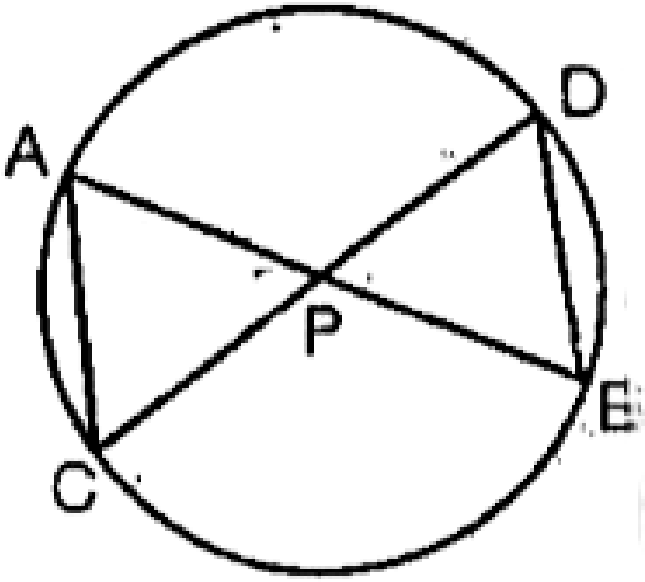
8. In two chords AB and CD intersect each AB and CD intersect each other at the point P. Prove that



$\Delta APC \sim \Delta DPB$

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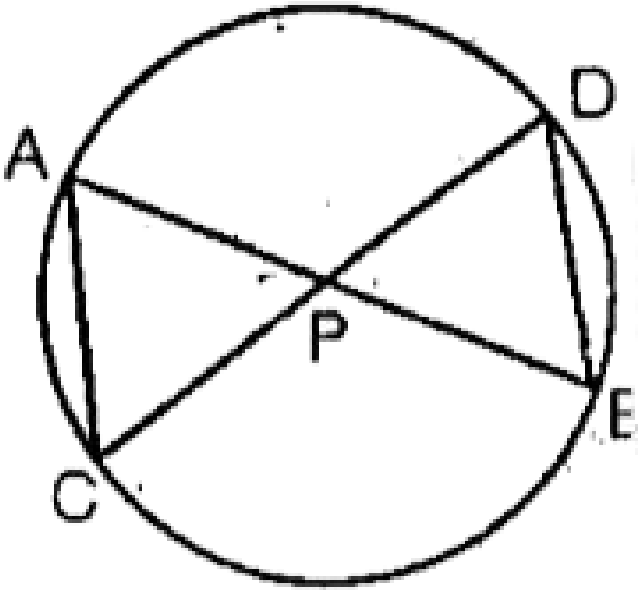
9. In two chords AB and CD intersect each AB and

CD intersect each other at the point P. Prove that



$AP.PB = CP.DP$

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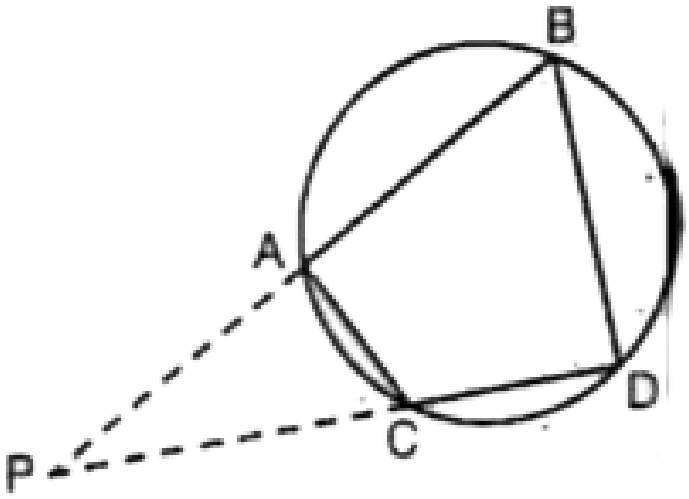
10. In two chords AB and CD of a circle intersect each other at the point P (when produced) outside the circle. Prove that



$\Delta PAC \sim PDB$

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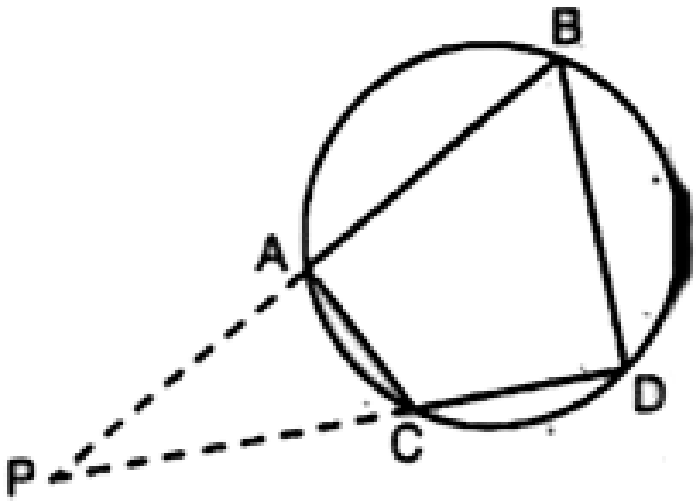
11. In two chords AB and CD of a circle intersect each other at the point P (when produced) outside the circle. Prove that



$PA.\,PB = PC.\,PD$

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