MATHS

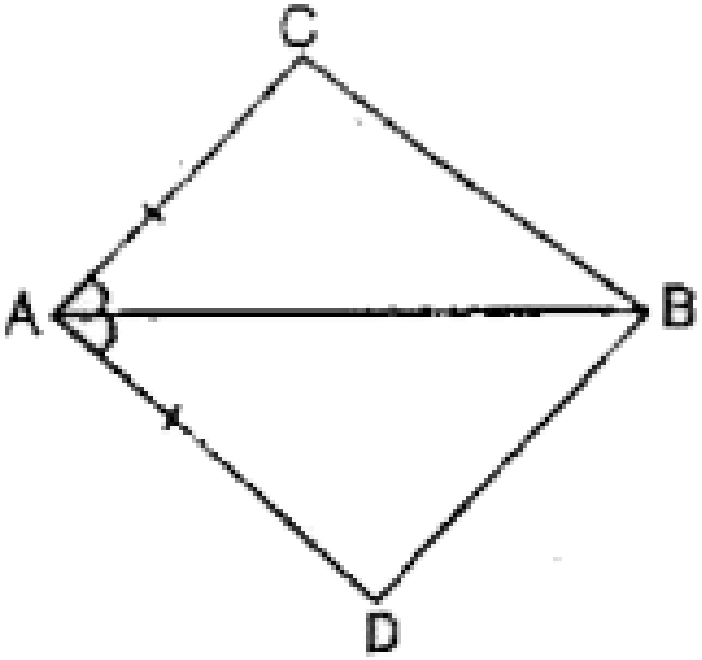
BOOKS - SWAN PUBLICATION

TRIANGLES

Exercise 7 1

1. In quadrilateral ABCD, AC = AD and AB bisect $\angle A$ show that $\Delta ABC \approx \Delta ABD$. What can

you say about BC and BD ?



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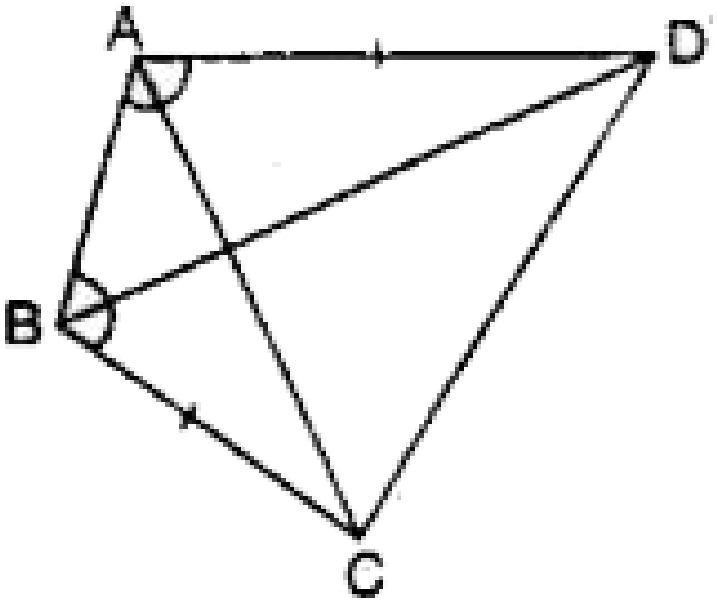
2. ABCD is a quadrilateral in which AD $= BC$ and $\angle DAB = \angle CBA$ Prove that



$\Delta ABD \approx \Delta BAC$

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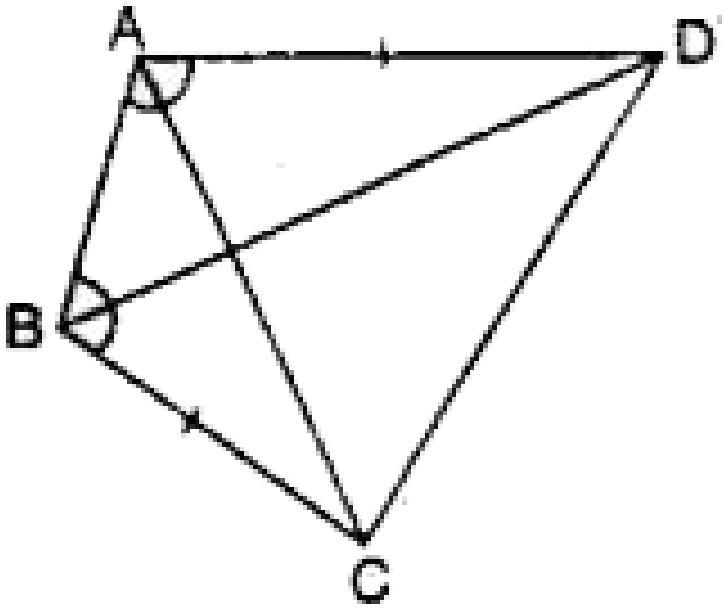
3. ABCD is a quadrilateral in which AD $= BC$ and $\angle DAB = \angle CBA$ Prove that



$BD = AC$

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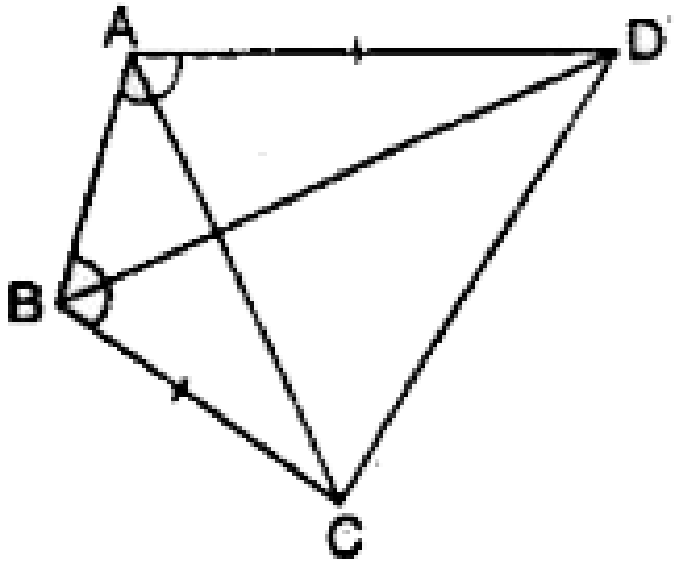
4. ABCD is a quadrilateral in which AD $= BC$ and $\angle DAB = \angle CBA =$ Prove that



$\angle ABD = \angle BAC$

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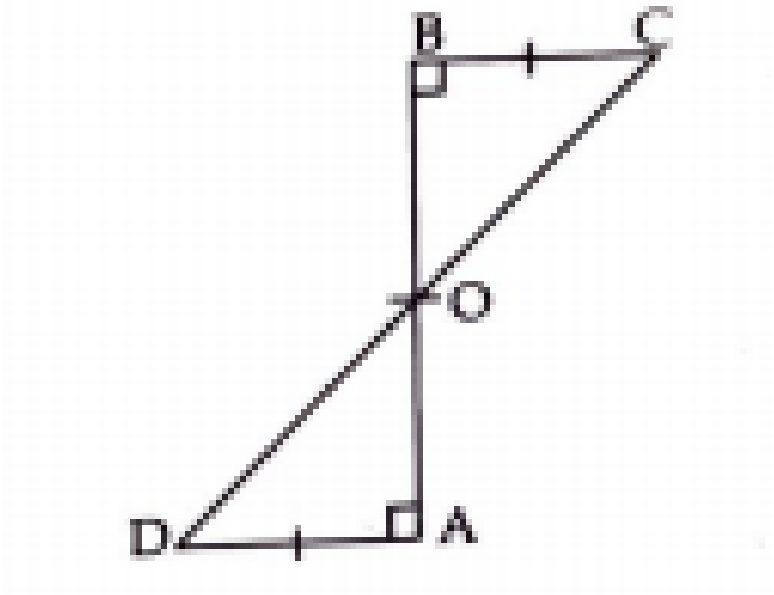
5. AD and BC are equal perpendicular to a line segment AB. Show that CD bisects AB



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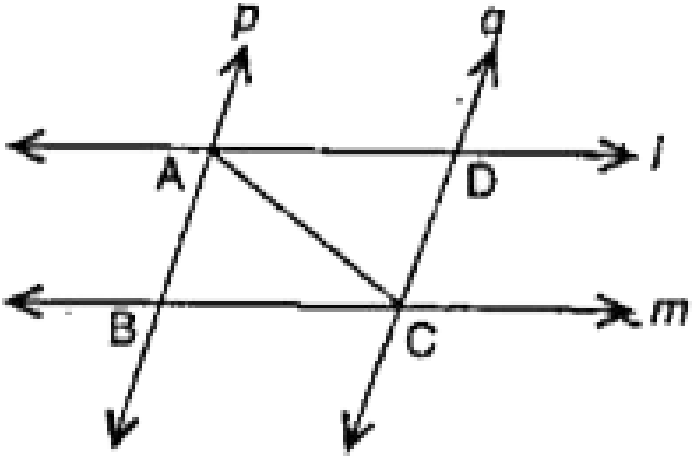
6. l and m are two parallel lines intersected by another pair of parallel lines p and q Show

that $\Delta ABC \approx \Delta CDA$.



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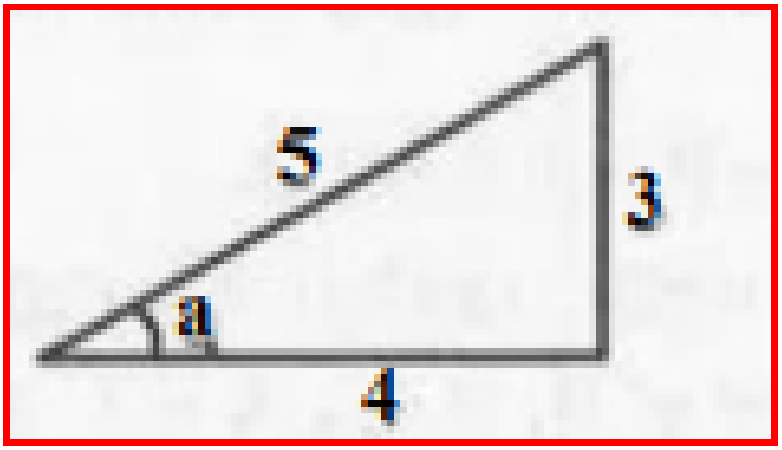
7. What is the value of $\sin a$.



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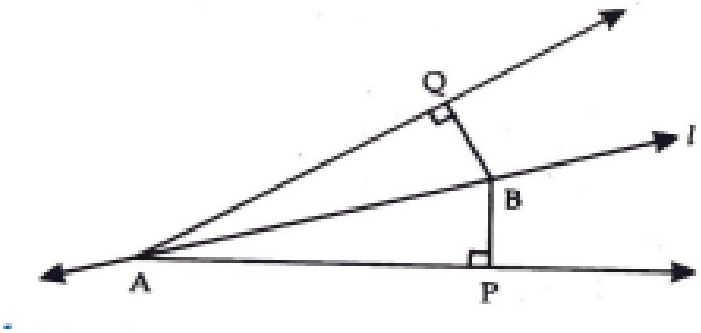
8. Line l is the bisector of an angle $\angle A$ and B is any point on l. BP and BQ are perpendiculars from B to the arms of $\angle A$ show that:

$\triangle APB \equiv \triangle AQB$



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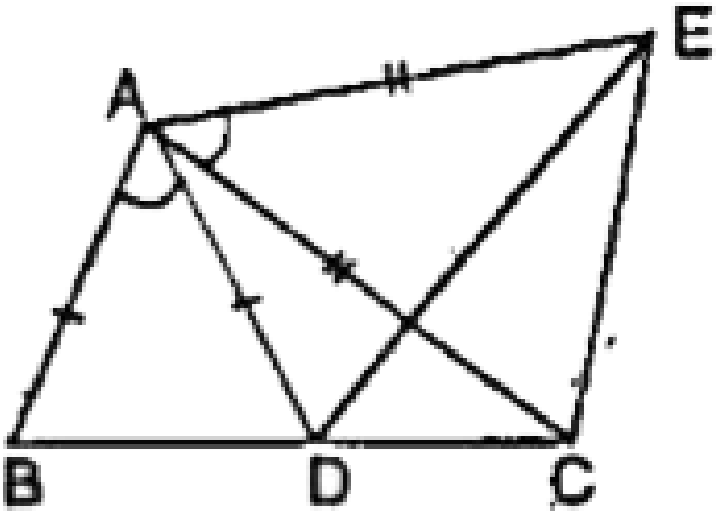
9.

$AC = AE, AB = AD$ and $\angle BAD = \angle EAC.$

show that $BC = DE$.



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10. AB is a line segment and P is its midpoint. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$

. Show that $\Delta DAP \cong \Delta EBP$.

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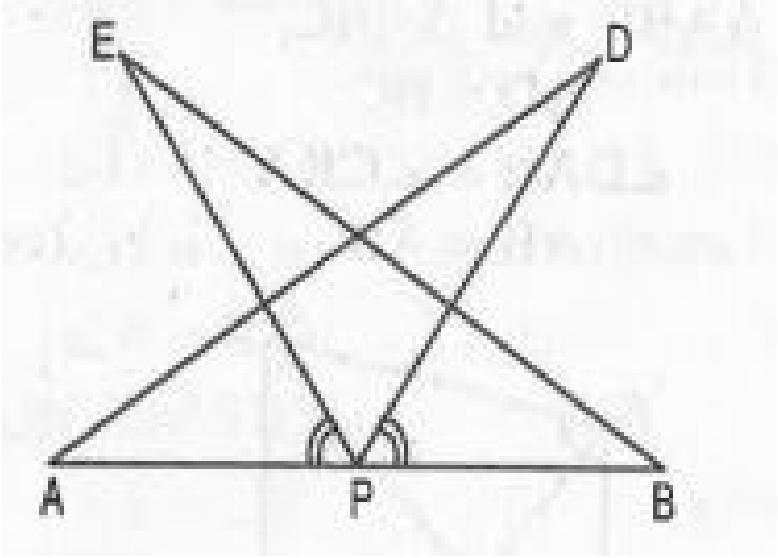
11. AB is a line segment and P is its midpoint. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$

. Show that AD=BE.



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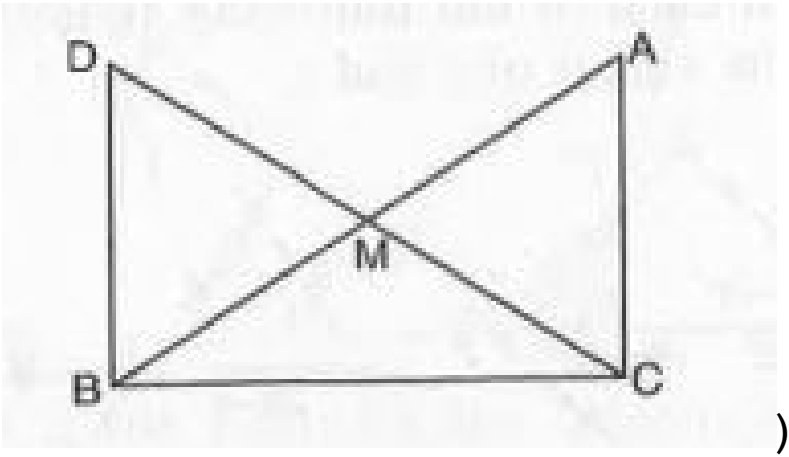
12. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM =

CM. Point D is joined to point B (See Fig.



) Show that : $\Delta AMC \cong \Delta BMD$.

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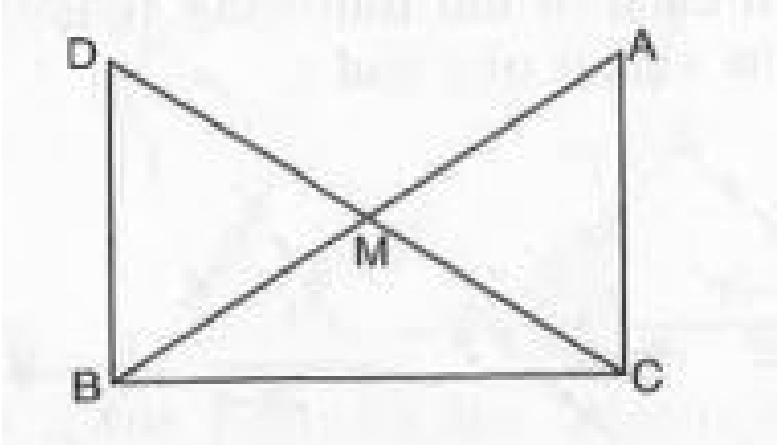
13. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM =

CM. Point D is joined to point B (See Fig.)



Show that : $CM = \frac{1}{2}AB$.

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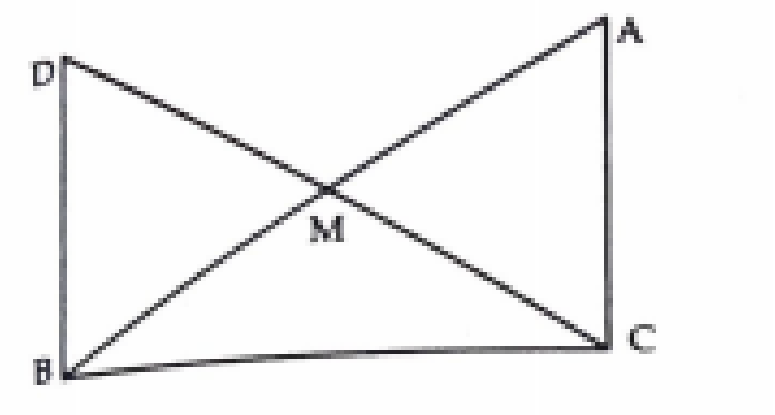
14. In right triangle ABC, right angled at C, M is the mid point of hypotenuse AB. C is joined to M and produced to a point D such that

DM=CM. point D is joined to point B. show that



$\triangle DBC \equiv \triangle ACB$

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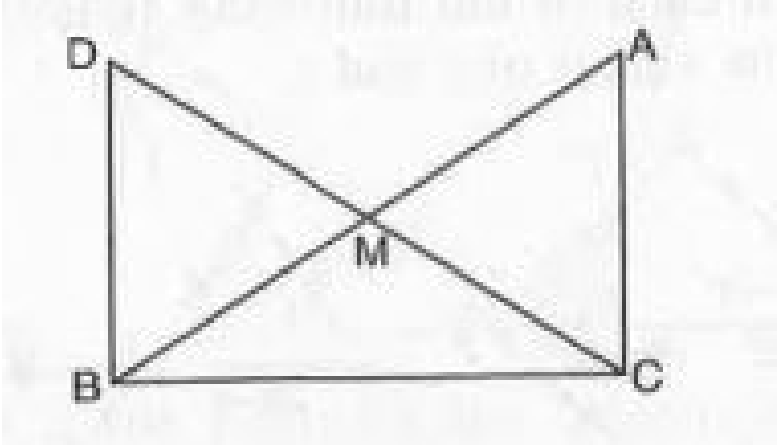
15. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM =

CM. Point D is joined to point B (See Fig.)



Show that : $CM = \frac{1}{2}AB$.

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Exercise 7 2

1. In an isosclees triangle ABC, with AB = AC, the bisectors of $\angle B$ and $\angle C$ intersect each other at O. Join A to O show that : OB=OC.

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2. In an isosclees triangle ABC, with AB = AC, the bisectors of $\angle B$ and $\angle C$ intersect each other at O. Join A to O show that : AO bisects $\angle A$.

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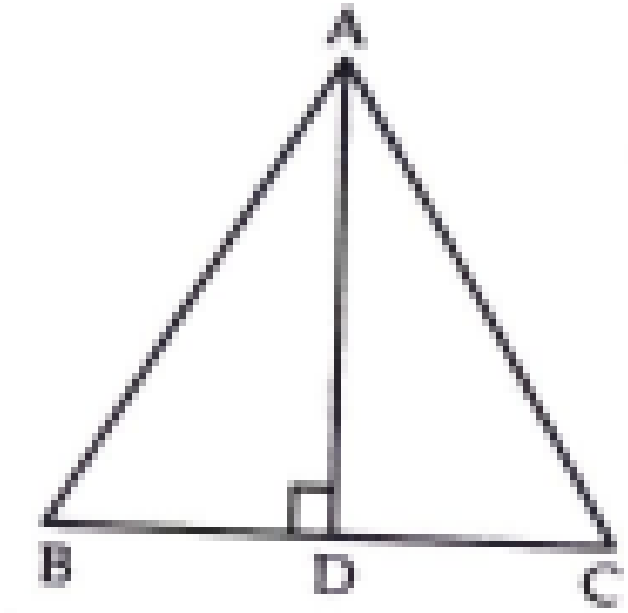
3. In $\triangle ABC$, AD is the perpendicular bisector of BC. Show that $\triangle ABC$ is an isosceles triangle in which AB=AC



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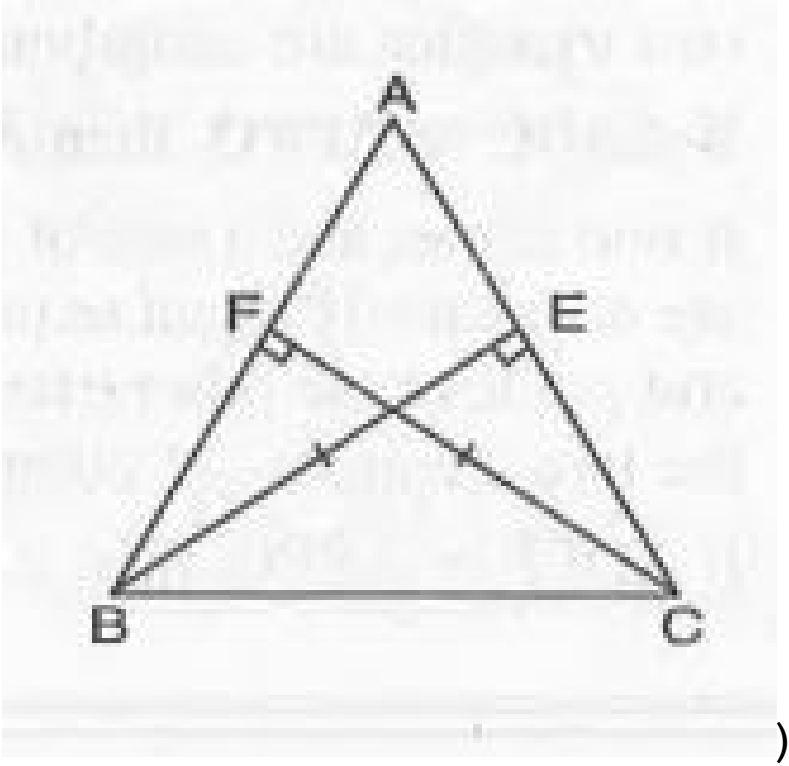
4. ABC is an isosceles triangle in which altitudes BE and CF are drawn to sides AC and AB respectively (See Fig.



). Show that these altitudes are equal.

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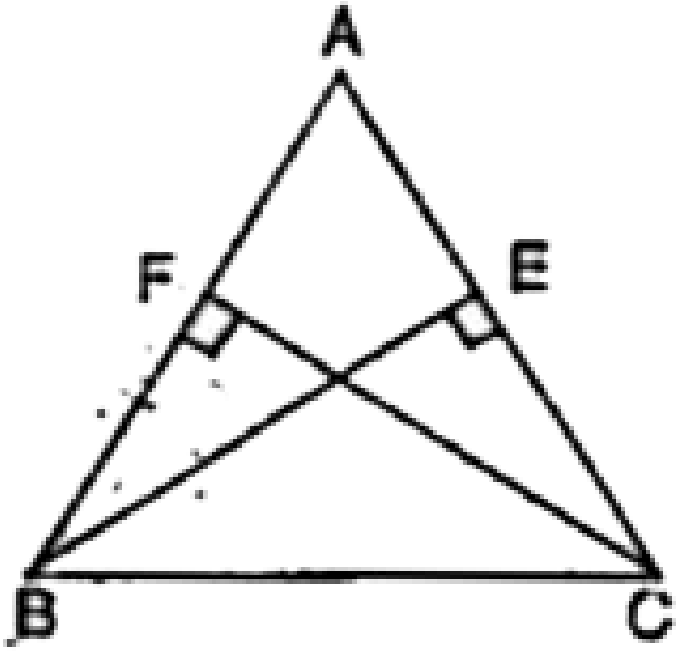
5. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal Show that



$\Delta ABE \approx \Delta ACF$

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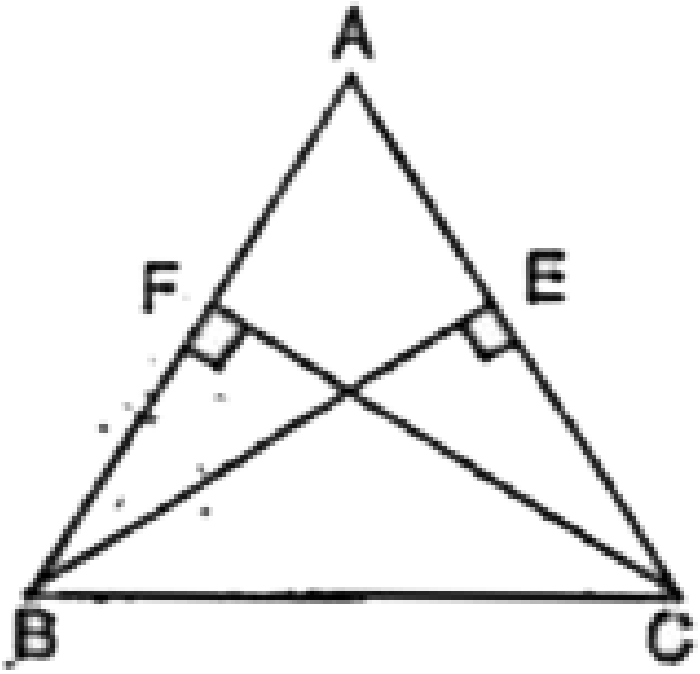
6. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal Show that



$AB = AC,$ i.e., ABC is an isosceles

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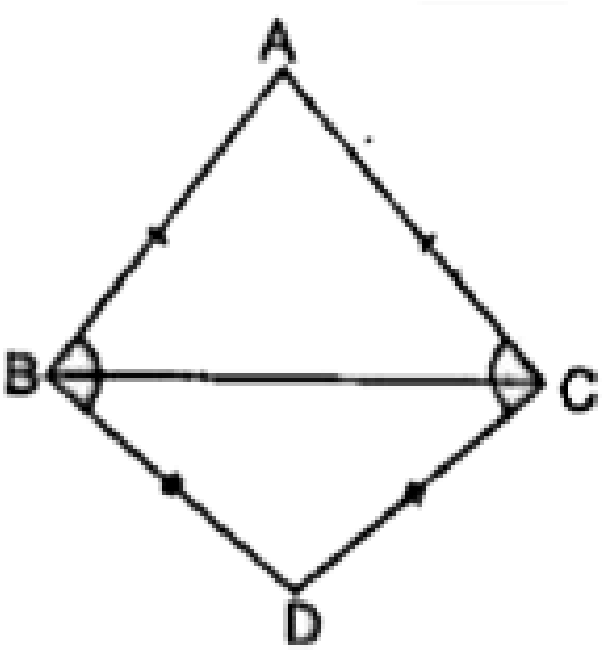
7. ABC and DBC are two isosceles trianges on the same base BC Show that $\angle ABD = \angle ACD.$



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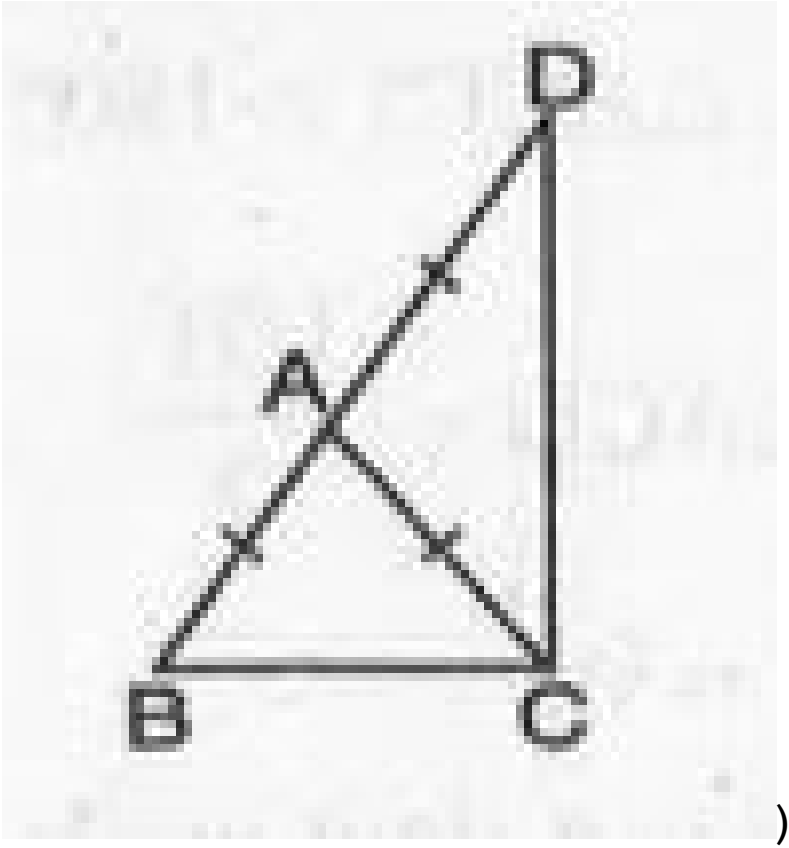
8. ΔABC is an isoscelestriangle in which AB = AC. Side BA is produced to D such that AD = AB. Show that $\angle BCD$ is a right angle (see Fig.



).

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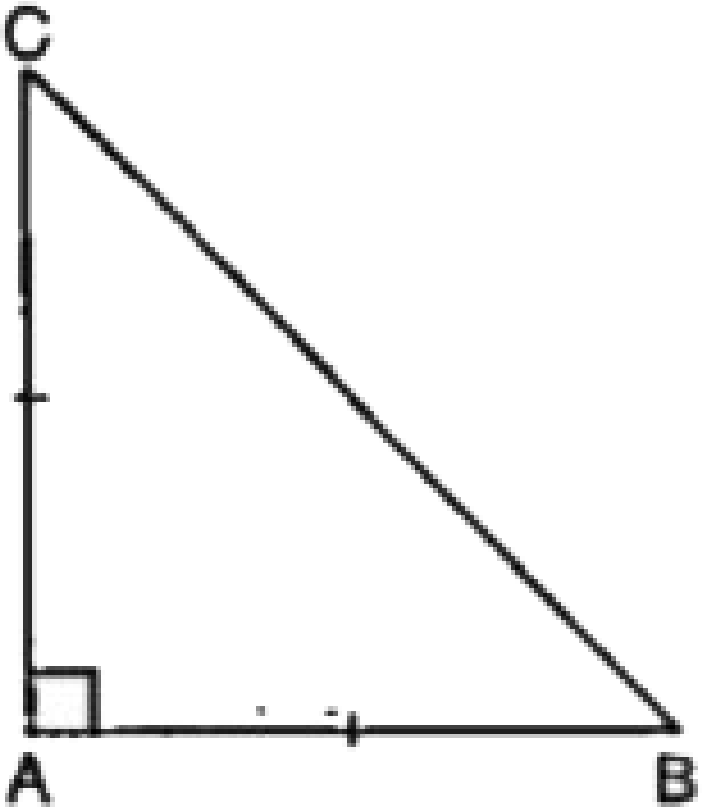
9. ABC is a right angled triange in which $\angle A = 90^\circ$ and $AB = AC$. Find $\angle B$ and $\angle C$.



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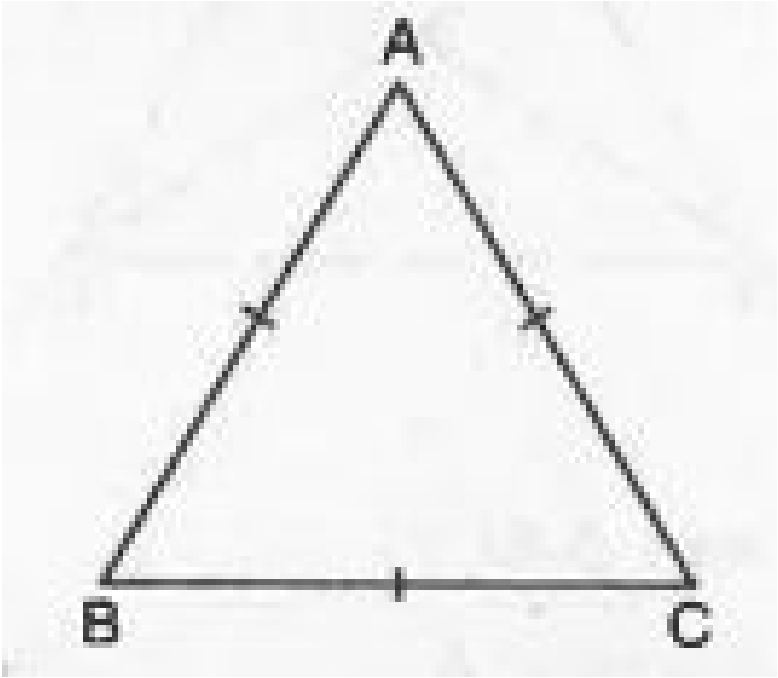
10. Show that the angles of an equilateral triangle are 60° each.



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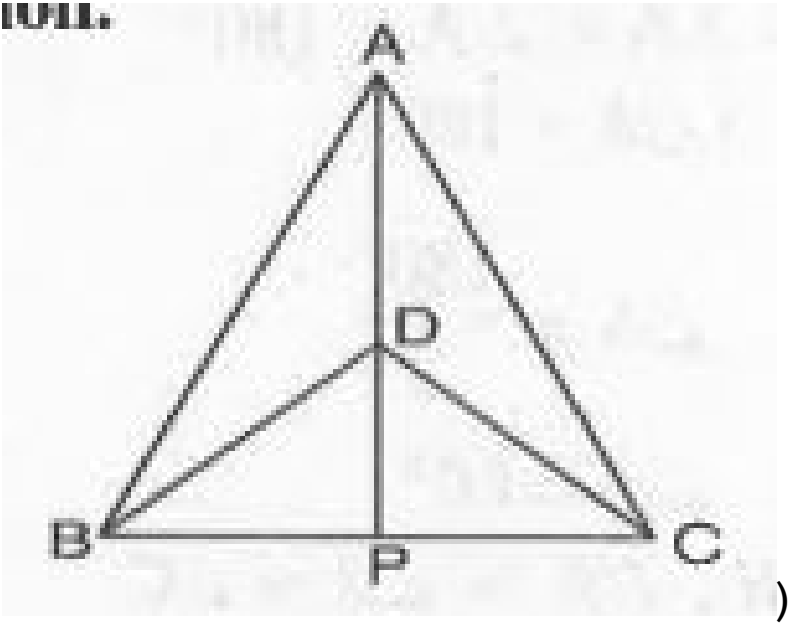
Exercise 7 3

1. 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 $\Delta ABD \cong \Delta ACD$.

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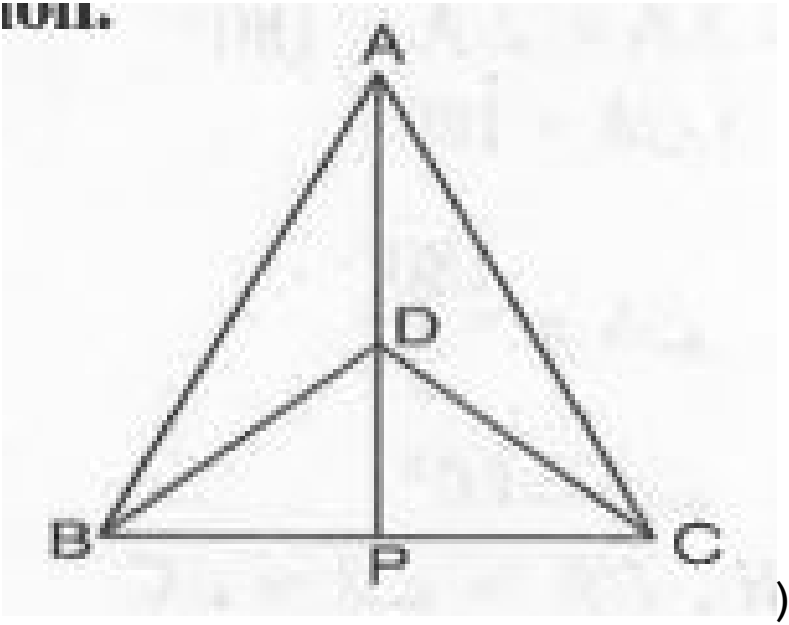
2. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (See Fig.



).If AD is

extended to intersect BC at P, show that $\Delta ABD \cong \Delta ACD$.

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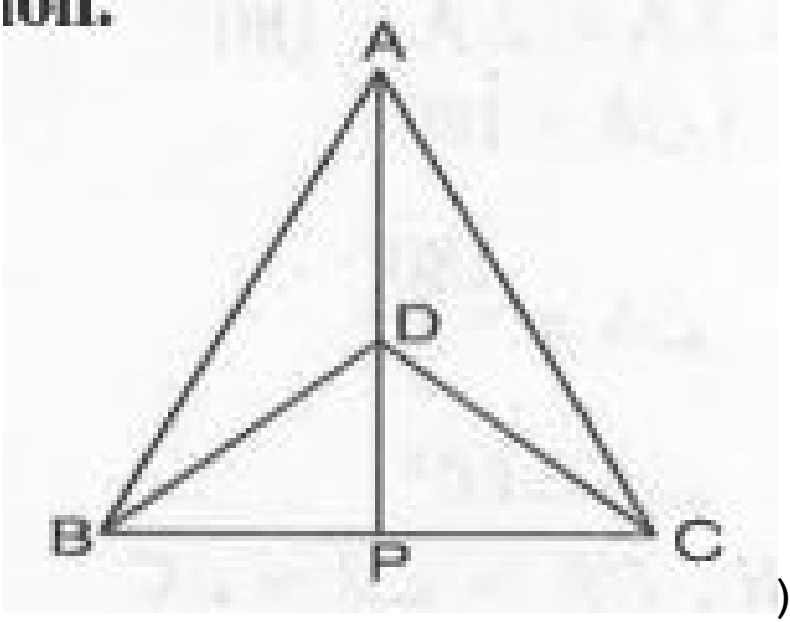
3. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (See Fig.



).If AD is extended to intersect BC at P, show that AP bisects $\angle A$ as well as $\angle D$.

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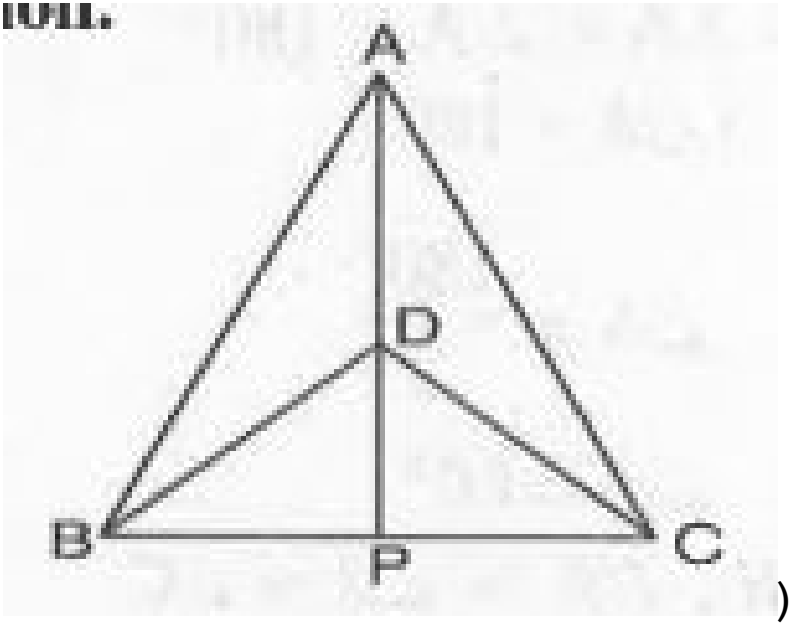
4. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A

and D are on the same side of BC (See Fig.



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

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5. AD is an altitude of an isosceles triangle ABC in which AB = AC. Show that:- AD bisects BC

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6. AD is an altitude of an isosceles triangle ABC in which AB = AC. Show that:- AD bisects BC

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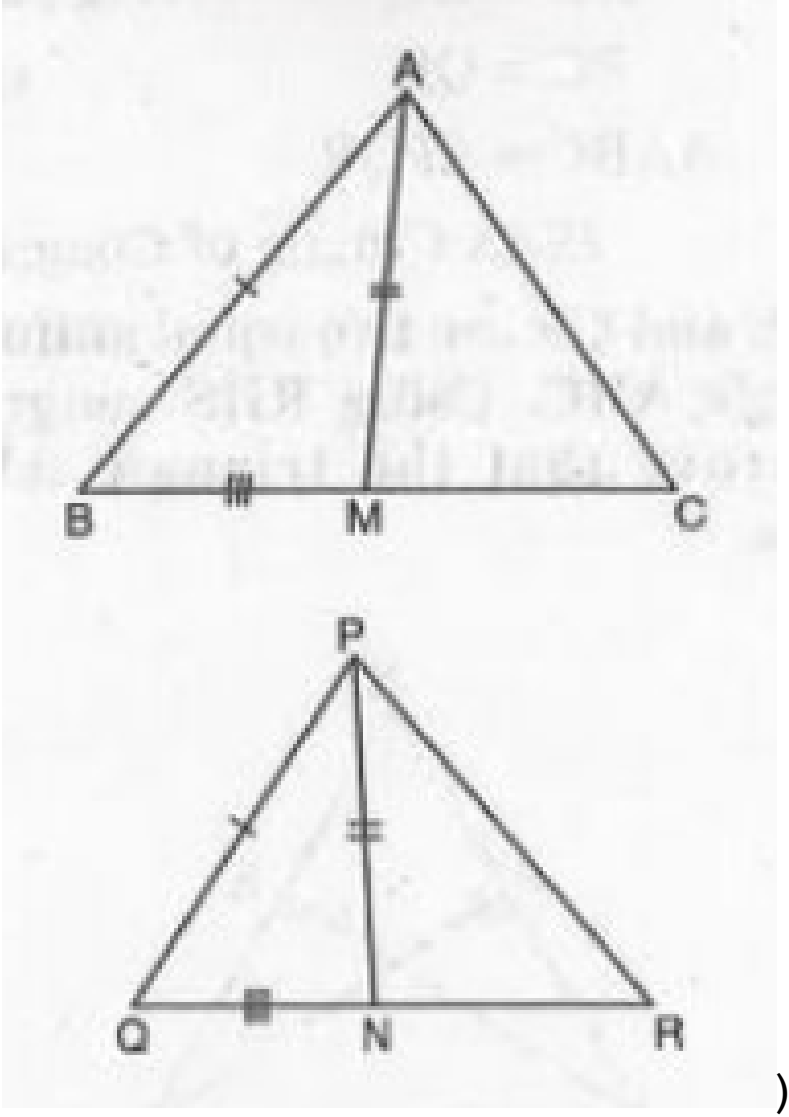
7. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of ΔPQR (See Fig



). Show that : $\Delta ABM \cong \Delta PQN.$

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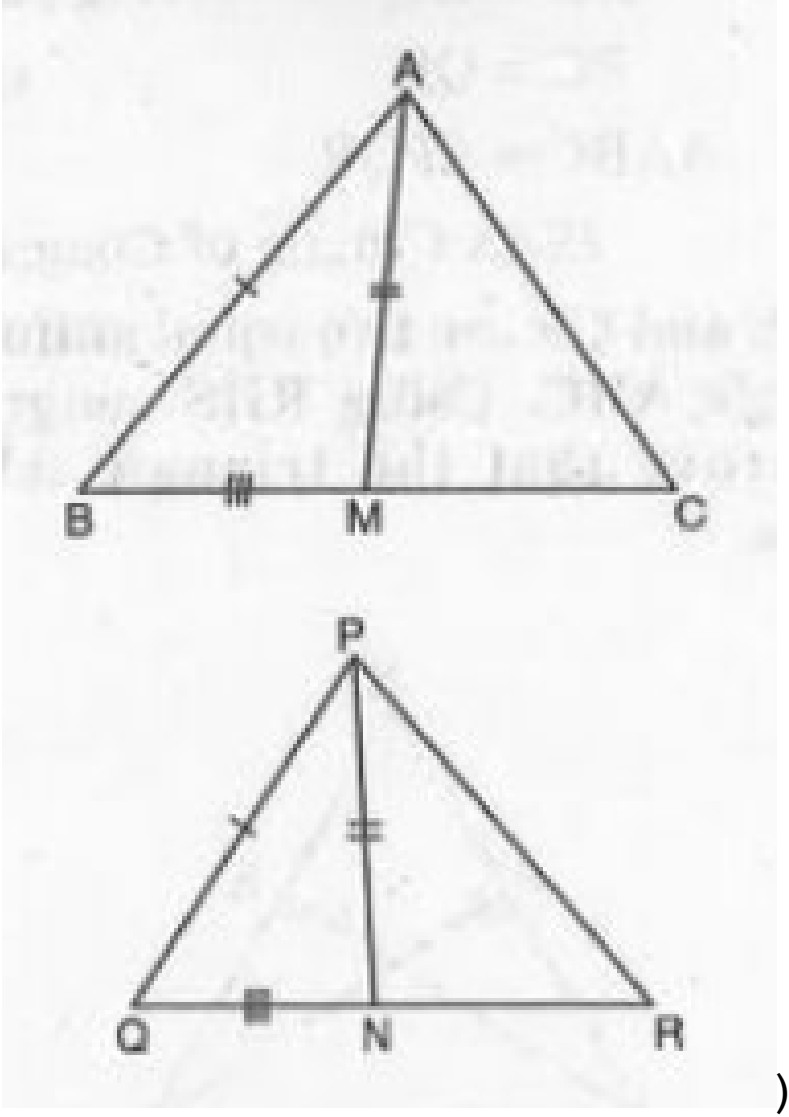
8. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of ΔPQR (See Fig



). Show that : $\Delta ABM \cong \Delta PQN.$

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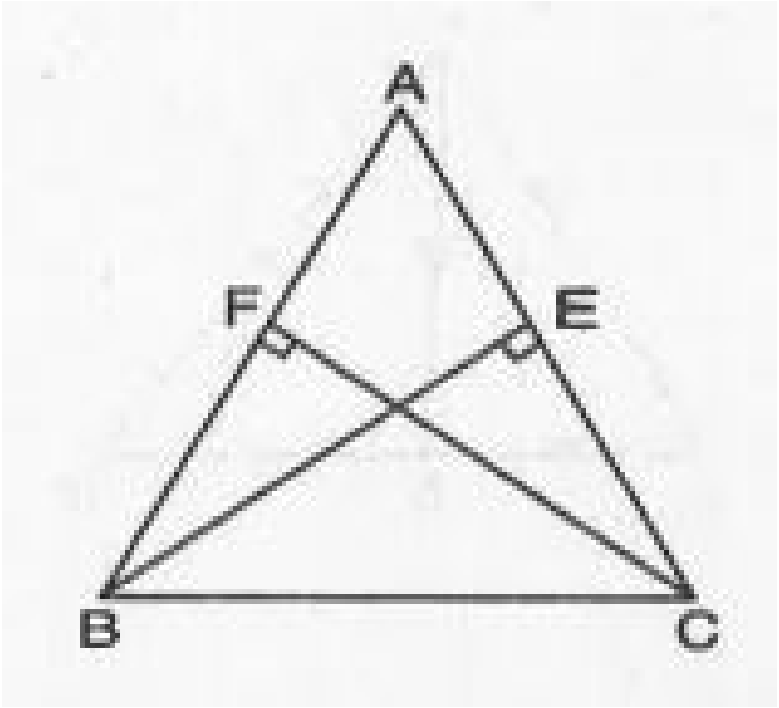
9. BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles.



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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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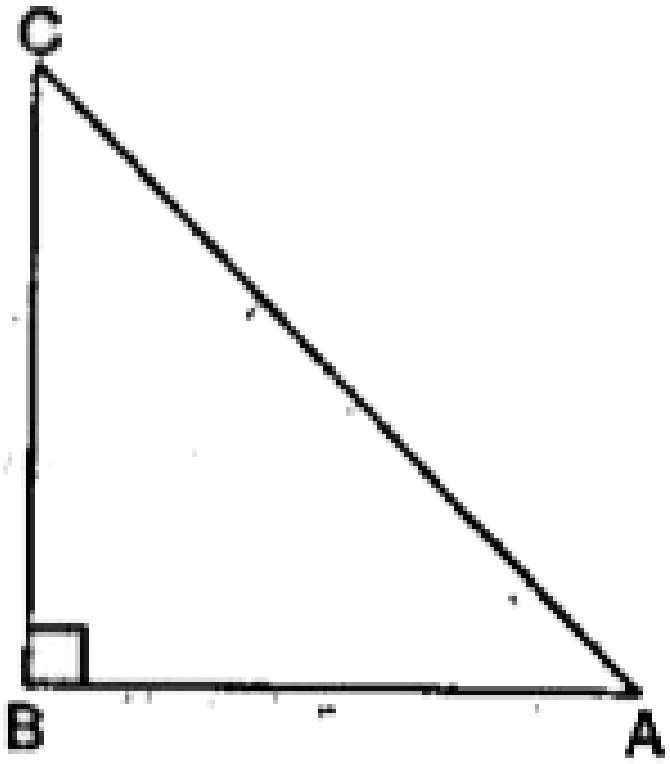
Exercise 7 4

1. Show that in a right angled triangle, the hypotenuse is the longest side.



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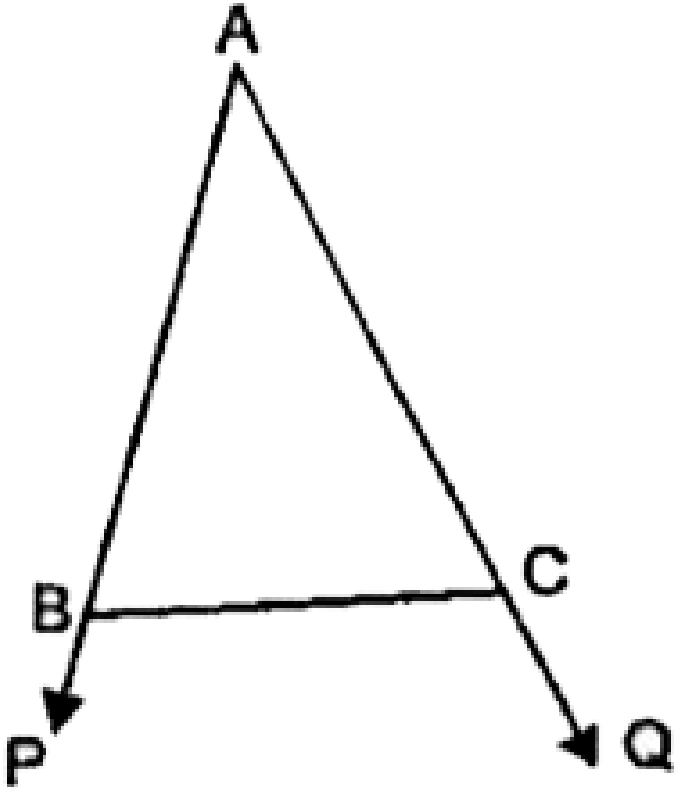
2. sides AB and AC of ABC are extended to points P and Q respectively. Also

$\angle PBC < \angle QCB$. Show that $AC > AB$.



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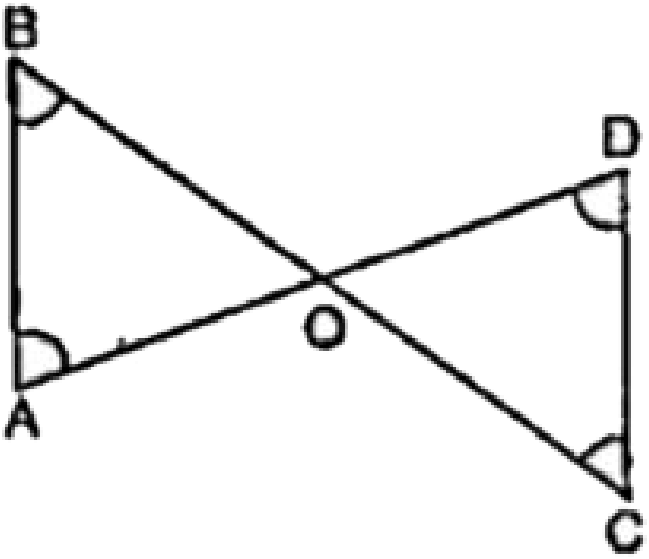
3. $\angle B < \angle A$ and $\angle C < \angle D$. Show that $AD < BC$.



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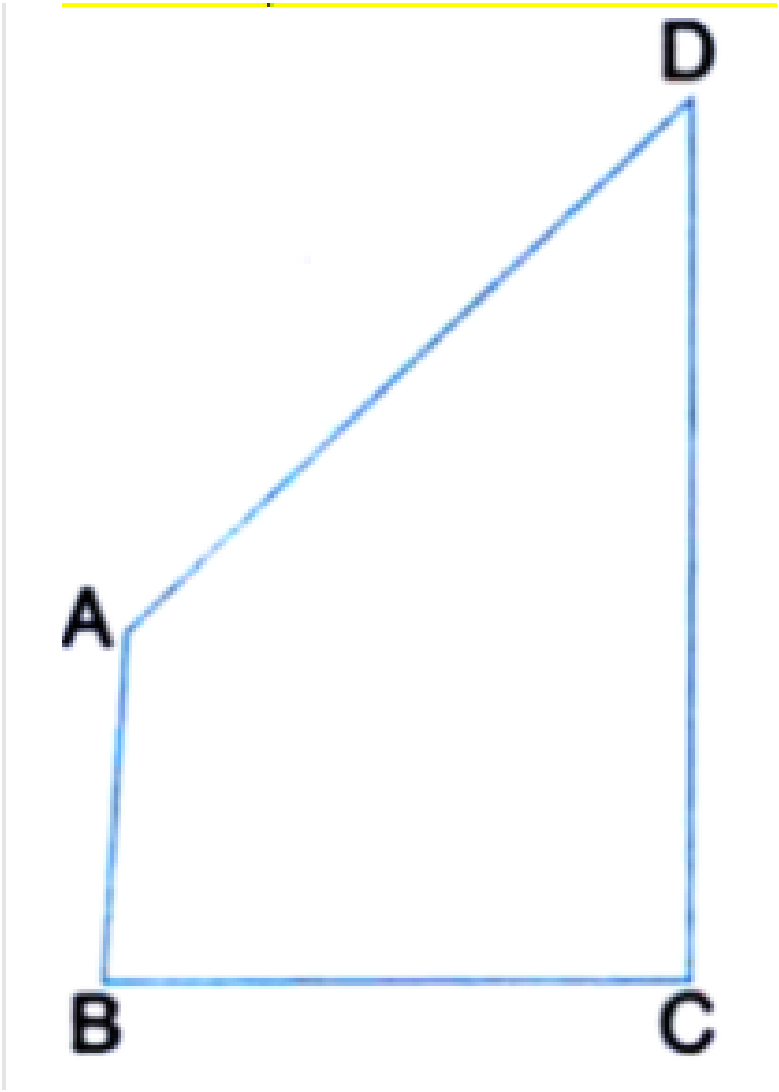
4. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see Fig.

7.50). Show that $\angle A > \angle C$ and $\angle B > \angle D$.



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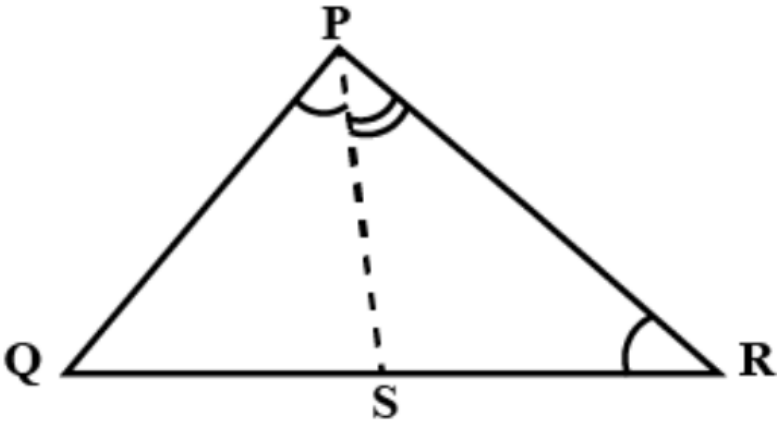
5. In Fig 7.51, PR > PQ and PS bisects $\angle QPR$.

Prove that $\angle PSR > \angle PSQ$.



A. $\angle PSQ$

B.

C.

D.

Answer:

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6. Show that of all line segments drawn from a given point not on it, the perpendicular line segment is the shortest.

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Exercise 7 5

1. ABC is a triangle. Locate a point in the interior of ΔABC which is equidistant from all the vertices of ΔABC.

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2. In a triangle locate a point in its interior which is equidistant from all the sides of the triangle.

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3. In a huge park, people are concentrated at the points

A: where there are difference slides for children

B: near which a man-made lake is situated

C: which is near to a large parking and each where should an icecream parlour be set up that maximum number of persons can

approach it

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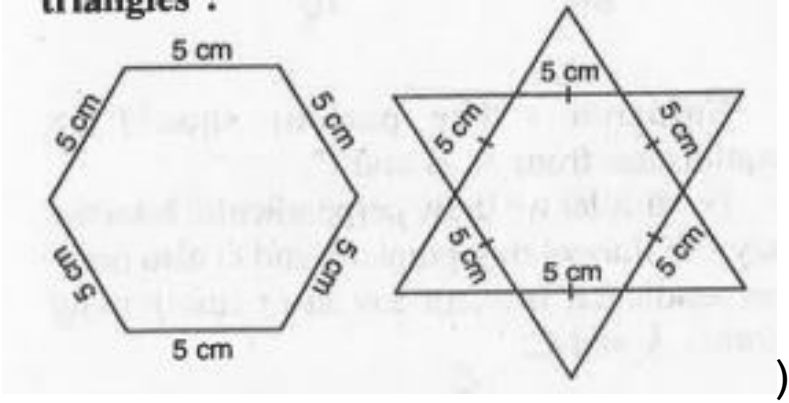
4. Complete the hexagonal rangoli and the star Rangolies (see Figs.



) by filling them with as many equilateral triangles of side 1 cm as you can. Count the number of triangles in each case. Which has more triangles ?

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Objective Type Questions

1. State whether the statement are true (T) or false (F):

Zero is a rational number.

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2. If .... And the included angle of one triangle are equal to two sides and the included angle of the other triangle then two triangles are congruent.

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3. State whether the statement are true (T) or false (F):

Zero is a rational number.

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4. The sides opposite to two equal angles of a triangle are :

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5. The sides opposite to two equal angles of a triangle are :

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6. Two right triangles are congruent if hypotenuse and one side of first-triangle are respectively equal to the hypotenuse and one corresponding side of the second triangle

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7. The measure of each angle of an equilateral triangle is :

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8. State whether the statement are true (T) or false (F):

In a triangle side opposite to the larger (greater) angle is longer .

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9. In a triangle, the angle opposite to the longer side is :

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10. Sum of any two sides of a triangle is greater than the third side.

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11. If three angles of one triangle are equal to corresponding three angles of an other

triangle then triangles are congruent.

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12. Fill in the blank

If in two triangles $AB = QR, \angle A = \angle Q, \angle B = \angle R,$ then $\Delta ABC \approx$ .....

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13. If M is the mid point of hypotenuse AC of rt. ΔABC then $BM = \frac{1}{2}$.... .

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14. If in two triangles $\triangle PQR$ and $\triangle DEF$, PR=EF, QR=DE,PQ=FD, then $\triangle PQR \equiv$ ....

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15. The sides opposite to two equal angles of a triangle are :

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16. Fill in the blank

Each angle of an equilateral triangle is .....

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17. Fill in the blank

In a triangle ABC, if $BC = AB$ and $\angle C = 80^\circ$, then $\angle B =$ .....

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18. Fill in the blank

In a triangle PQR, if $\angle P = \angle R$ then PQ = ...

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19. Fill in the blank

In a right triangle the hypotenuse is ..... Side.

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20. If two sides of a triangle are unequal, then the larger side has the ..... angle opposite to it.

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