



MATHS

NCERT - NCERT MATHS (KANNADA ENGLISH)

TRIANGLES

Examples

1. In the given Figure AB and CD are intersecting at 'O', $OA = OB$ and $OD = OC$. Show

that (i) $\Delta AOD \cong \Delta BOC$ and (ii)

$AD \parallel BC$.



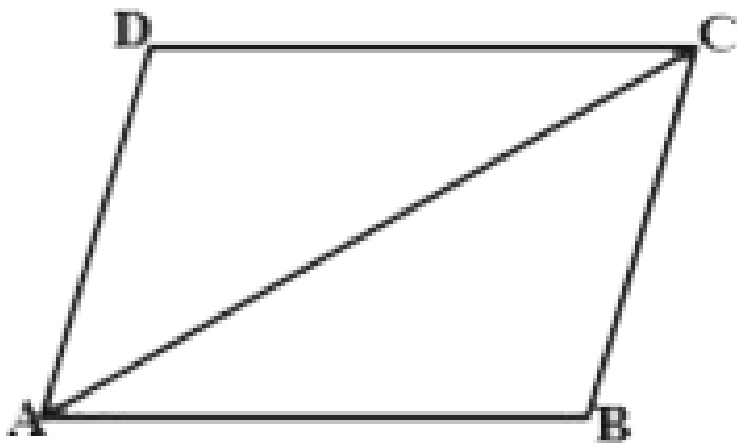
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2. AB is a line segment and line l is its perpendicular bisector. If a point P lies on l , show that P is equidistant from A and B .



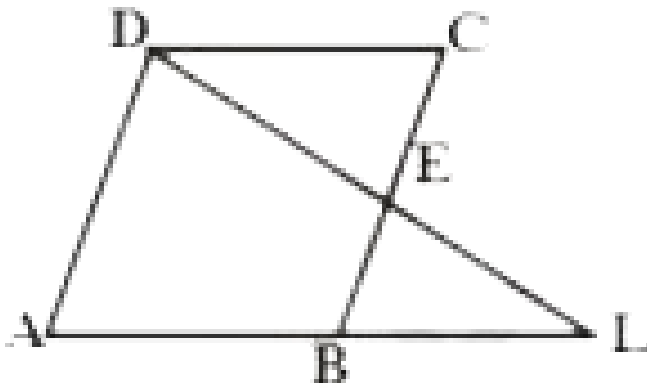
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3. In the given figure, $AB \parallel DC$ and $AD \parallel BC$
show that $\triangle ABC \cong \triangle CDA$.



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4. In the given figure, $AL \parallel DC$, E is mid point of
BC. Show that $\triangle EBL \cong \triangle ECD$.

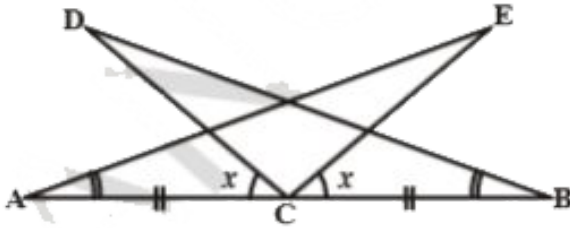


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5. Use the information given in the adjoining figure, to prove :

$$(i) \triangle DBC \cong \triangle EAC$$

(ii) $DC = EC$.

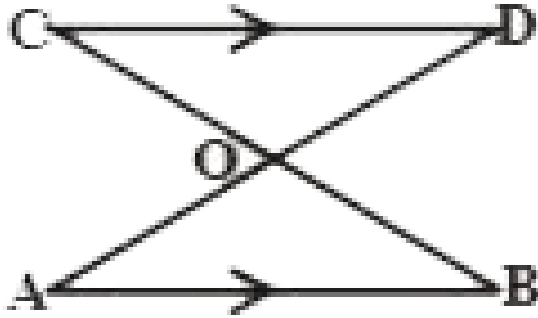


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6. Line-segment AB is parallel to another line-segment CD . O is the mid-point of AD .

Show that (i) $\triangle AOB \cong \triangle DOC$ (ii) O is also

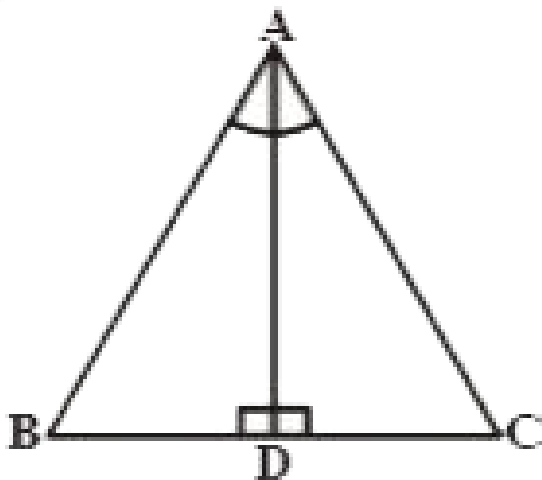
the mid-point of BC.



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7. In $\triangle ABC$, the bisector AD of A is perpendicular to side BC Show that $AB = AC$

and $\triangle ABC$ is isosceles.

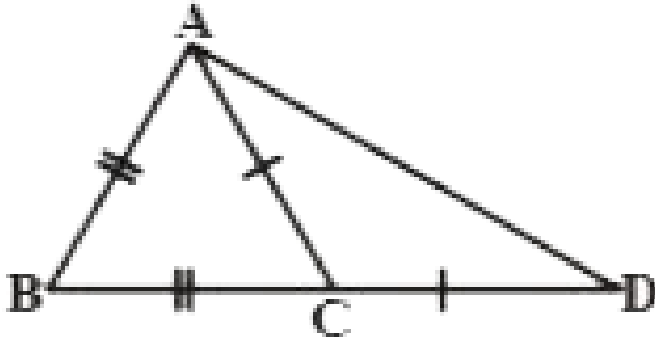


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8. In the adjacent figure,

$AB = BC$ and $AC = CD$. Prove that :

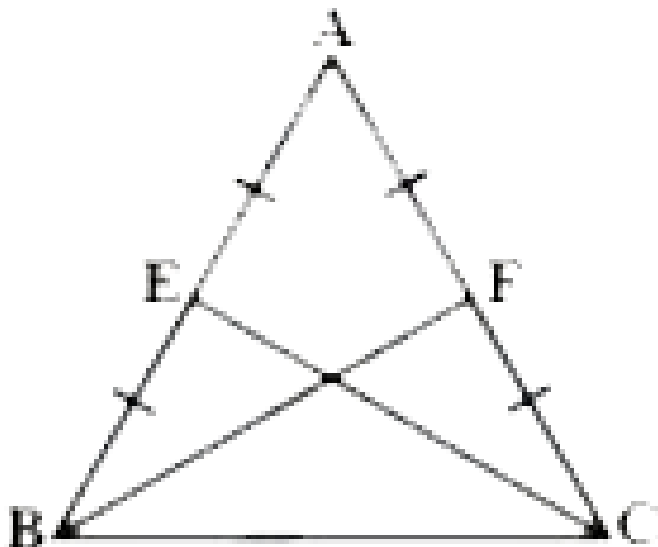
$$\angle BAD : \angle ADB = 3 : 1.$$



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9. E and F are respectively the mid-points of equal sides AB and AC of $\triangle ABC$ (see figure)

Show that $BF = CE$.



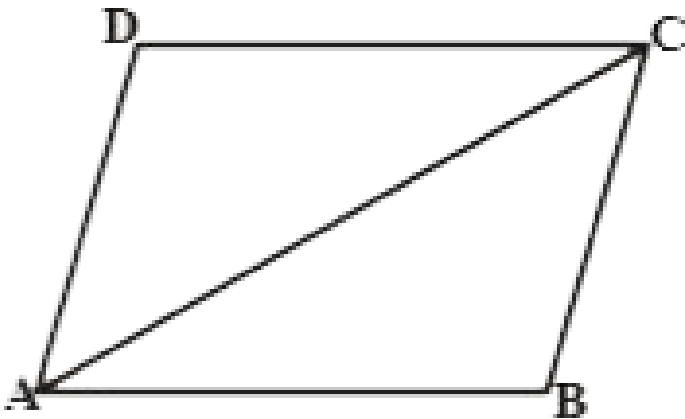
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10. In an isosceles triangle ABC with $AB = AC$, D and E are points on BC such that $BE = CD$ (see

figure) Show that $AD = AE$

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11. In quadrilateral $ABCD$, $AB = CD$, $BC = AD$ show that $\triangle ABC \cong \triangle CDA$ Consider $\triangle ABC$ and $\triangle CDA$



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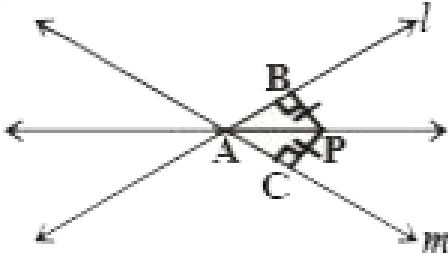
12. AB is a line - segment. P and Q are points on either side of AB such that each of them is equidistant from the points A and B (See Fig). Show that the line PQ is the perpendicular bisector of AB .



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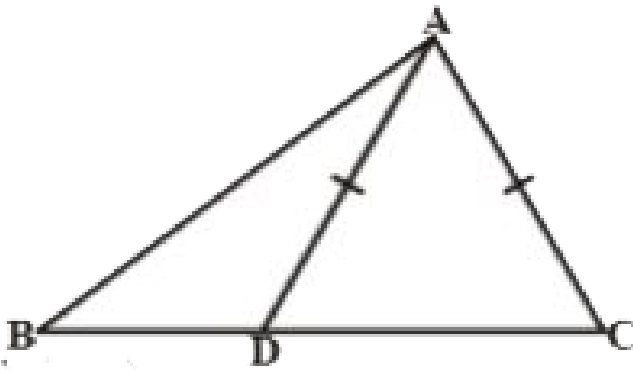
13. P is a point equidistant from two lines l and m intersecting at point A (see figure). Show

that the line AP bisects the angle between them.



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14. D is a point on side BC $\triangle ABC$ such that $AD = AC$ (see figure). Show that $AB > AD$.



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Do This

1. There are some statements given below.

Write whether they are true or false :

Two circle are always congruent.



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2. There are some statements given below.

Write whether they are true or false :

Two right angle triangles are sometimes congruent.



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3. Find the component statements of the following compound statements and check

whether they are true or false.

Number 3 is prime or it is odd.



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4. There are some statements given below.

Write whether they are true or false :

Two equilateral triangles with their sides equal are always congruent.



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5. Which minimum measurements do you require to check if the given figures are congruent:

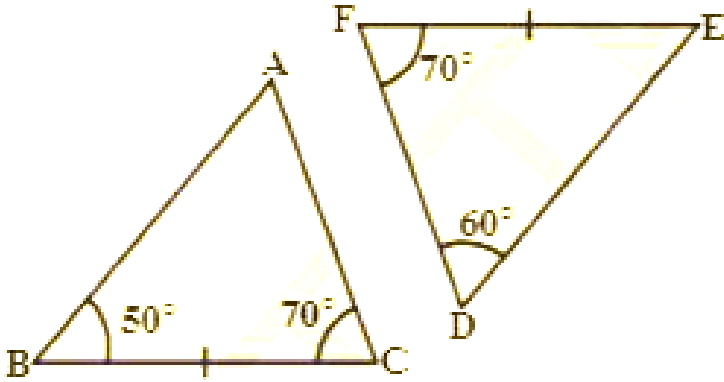
- i. Two rectangles ii. Two rhombuses.



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6. State whether the following triangles are congruent or not? Give reasons for your

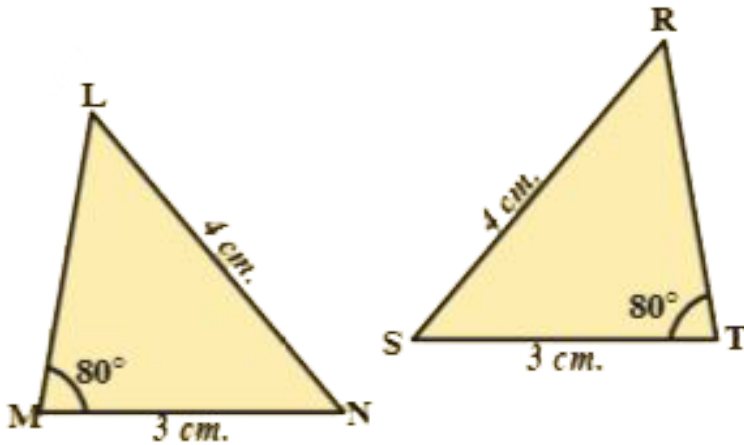
answer.



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7. State whether the following triangles are congruent or not? Give reasons for your

answer.



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8. In the given figure, the point P bisects AB and DC . Prove that

$$\triangle APC \cong \triangle BPD$$

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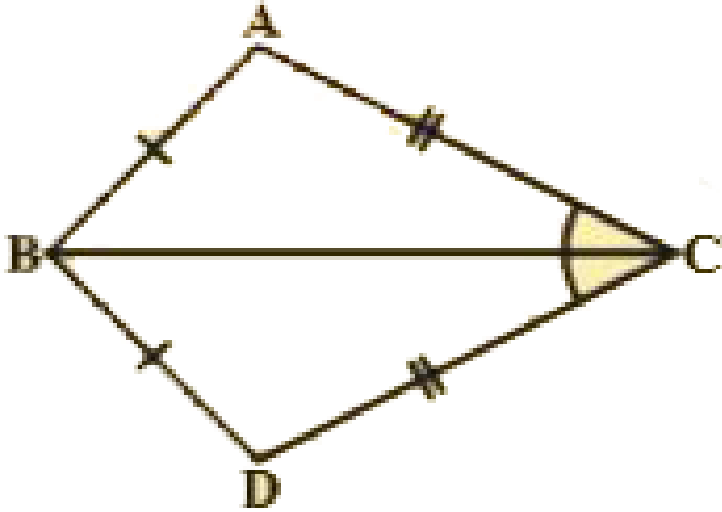
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9. In the adjacent figure $\triangle ABC$ and $\triangle DBC$ are two triangles such that $\overline{AB} = \overline{BD}$ and

$\overline{AC} = \overline{CD}$. Show that $\triangle ABC \cong \triangle DBC$.



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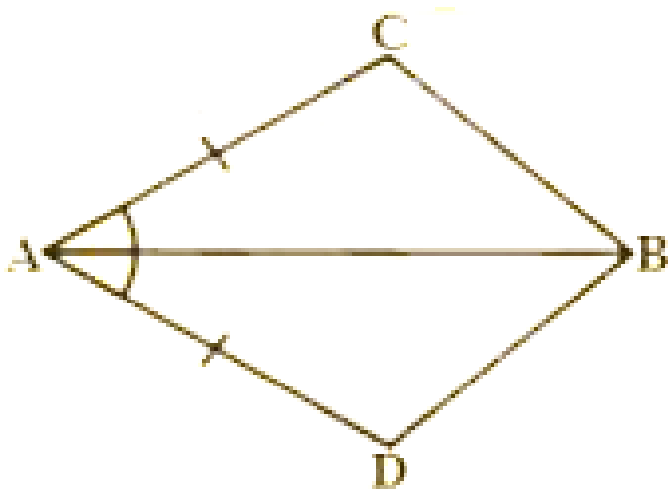
Exercise 7 1

1. In quadrilateral

$ACBD$, $AC = AD$ and AB bisects $\angle A$

Show that $\triangle ABC \cong \triangle ABD$.

What can you say about BC and BD ?



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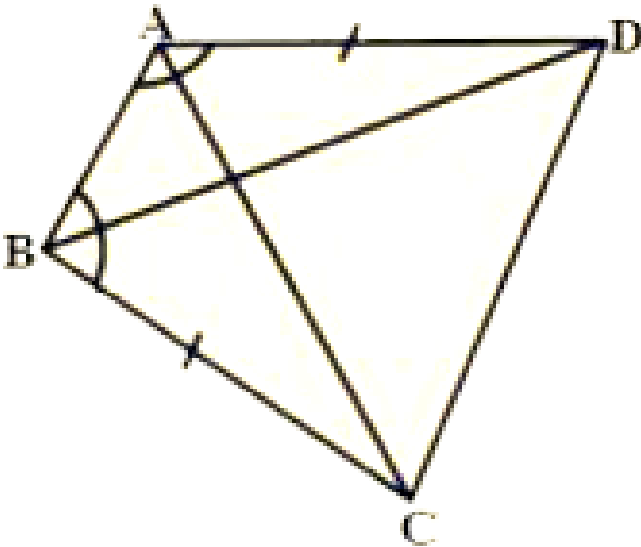
2. ABCD is a quadrilateral in which $AD = BC$ and

$\angle DAB = \angle CBA$ Prove that

(i) $\triangle ABD \cong \triangle BAC$

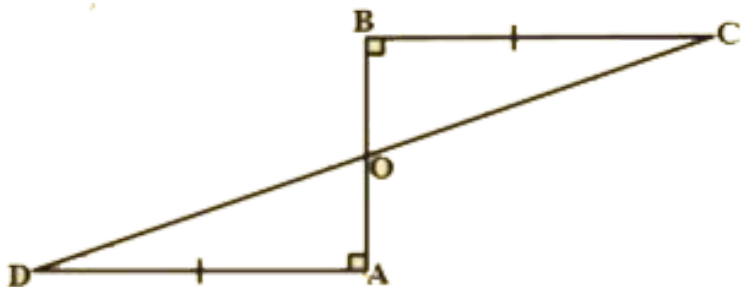
(ii) $BD = AC$

(iii) $\angle ABD = \angle BAC$



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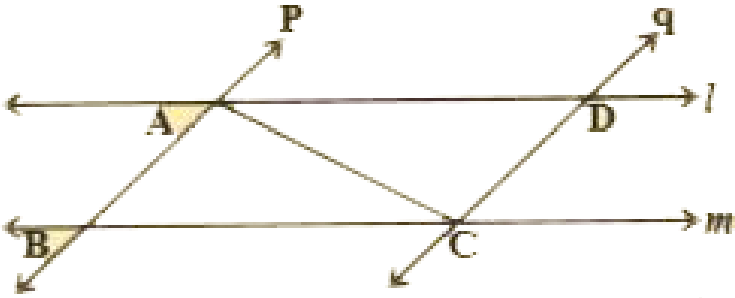
3. AD and BC are equal and perpendicular to a line segment AB. Show that CD bisects AB.



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

that $\triangle ABC \cong \triangle CDA$.

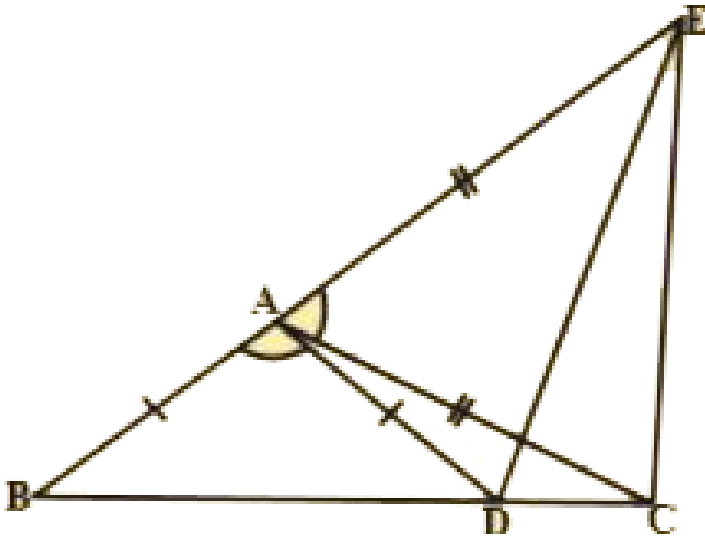


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5. In the adjacent figure,

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

. Show that $BC = DE$.



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6. In right triangle ABC , right angle is 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 figure).

Show that :

(i) $\triangle AMC \cong \triangle BMD$

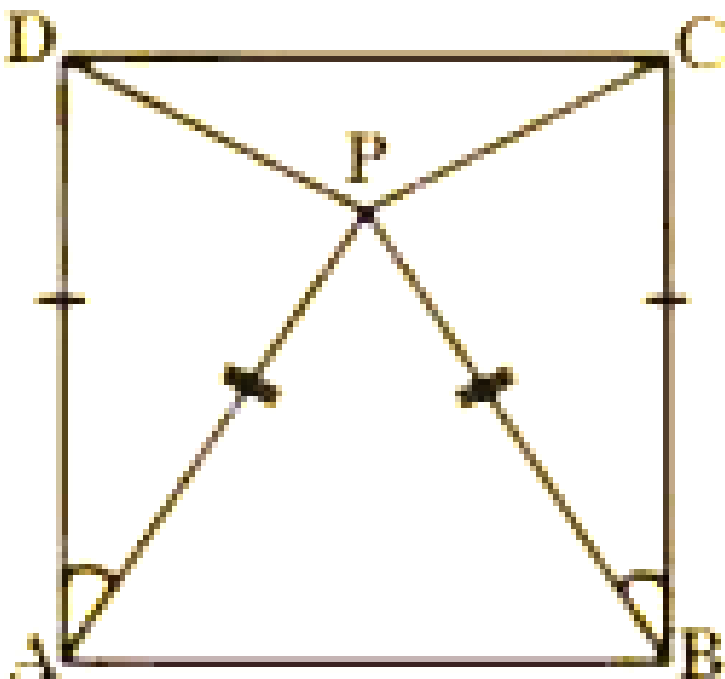
(ii) $\angle DBC$ is a right angle

(iii) $\triangle DBC \cong \triangle ACB$ (iv) $CM = \frac{1}{2}AB$.



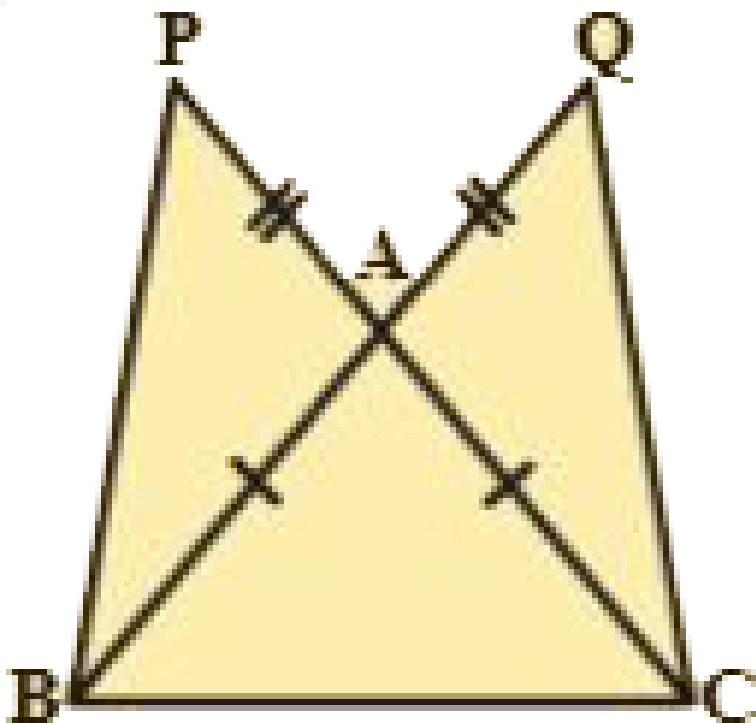
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7. In the adjacent figure ABCD is a square and $\triangle APB$ is an equilateral triangle. Prove that $\triangle APD \cong \triangle BPC$.



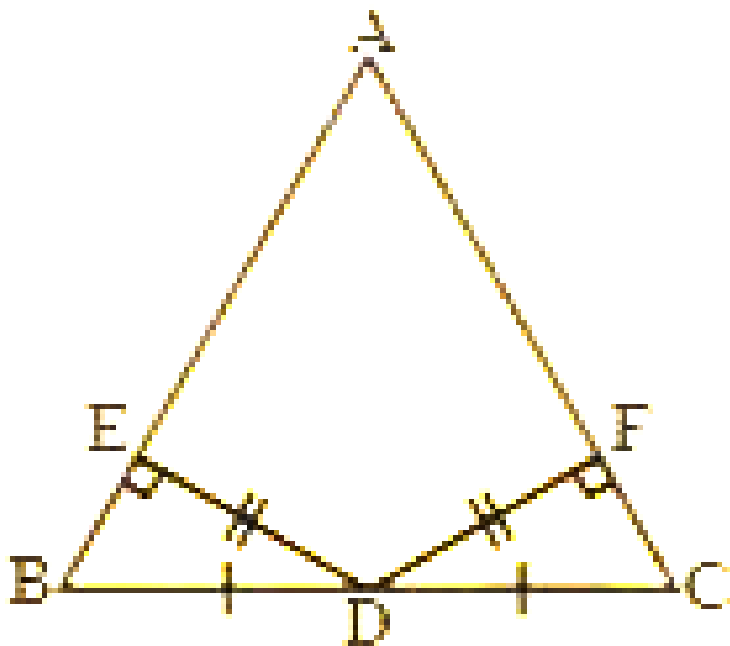
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8. In the adjacent figure $\triangle ABC$ is isosceles as $\overline{AB} = \overline{AC}$, \overline{BA} and \overline{CA} are produced to Q and P such that $\overline{AQ} = \overline{AP}$. . Show that $\overline{PB} = \overline{QC}$.



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9. In the adjacent figure $\triangle ABC$, D is the midpoint of BC . $DE \perp AB$, $DF \perp AC$ and $DE = DF$. Show that $\triangle BED \cong \triangle CFD$.



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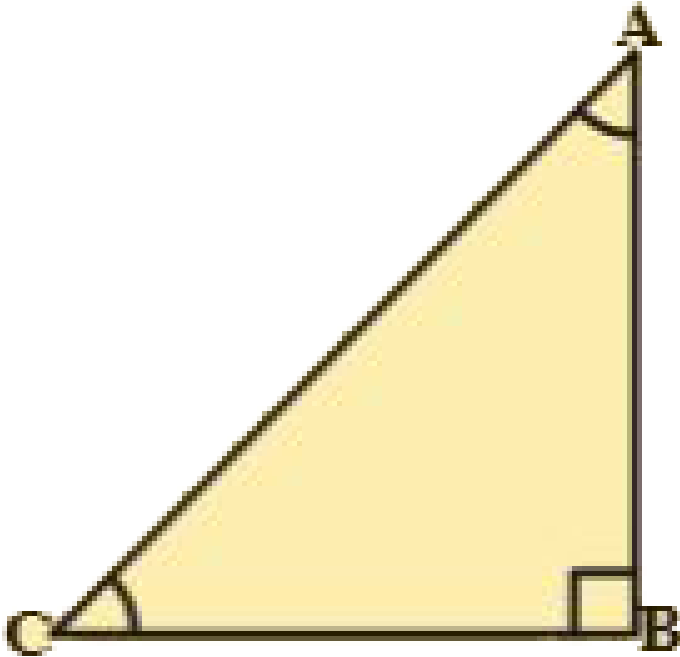
10. If the bisector of an angle of a triangle also bisects the opposite side, prove that the triangle is isosceles.



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11. In the given figure ABC is a right triangle and right angled at B such that $\angle BCA = 2\angle BAC$.

Show that hypotenuse $AC = 2BC$.

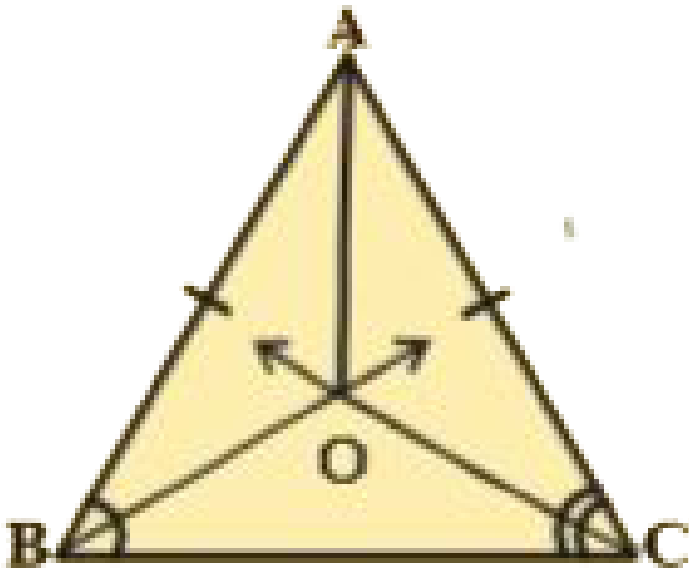


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Exercise 7 2

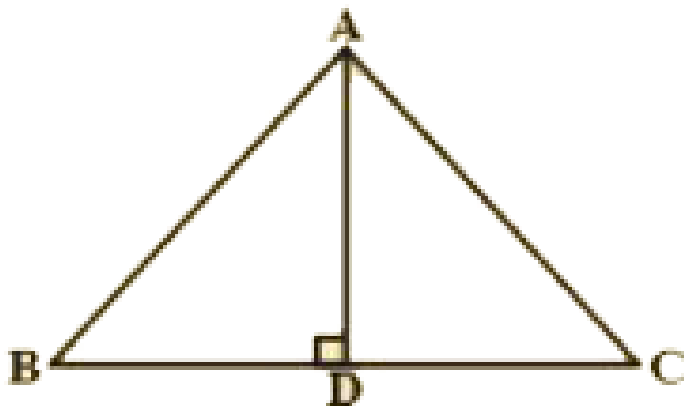
1. In an isosceles triangle ABC , with $AB = AC$, the bisectors of $\angle B$ and $\angle C$ intersect each other at O . Join A to O . Show that :

(i) $OB = OC$ (ii) AO bisects $\angle A$



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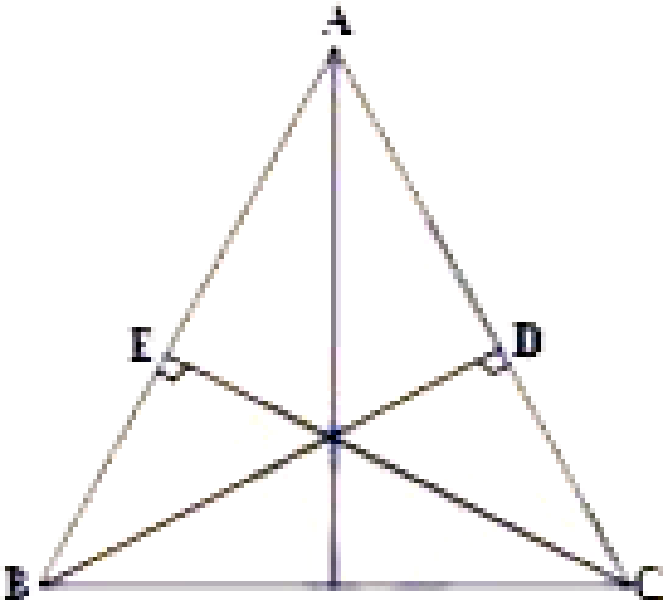
2. In $\triangle ABC$, AD is the perpendicular bisector of BC (See adjacent figure). Show that $\triangle ABC$ is an isosceles triangle in which $AB = AC$.



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3. ABC is an isosceles triangle in which altitudes BD and CE are drawn to equal sides

AC and AB respectively (see figure) Show that these altitudes are equal.



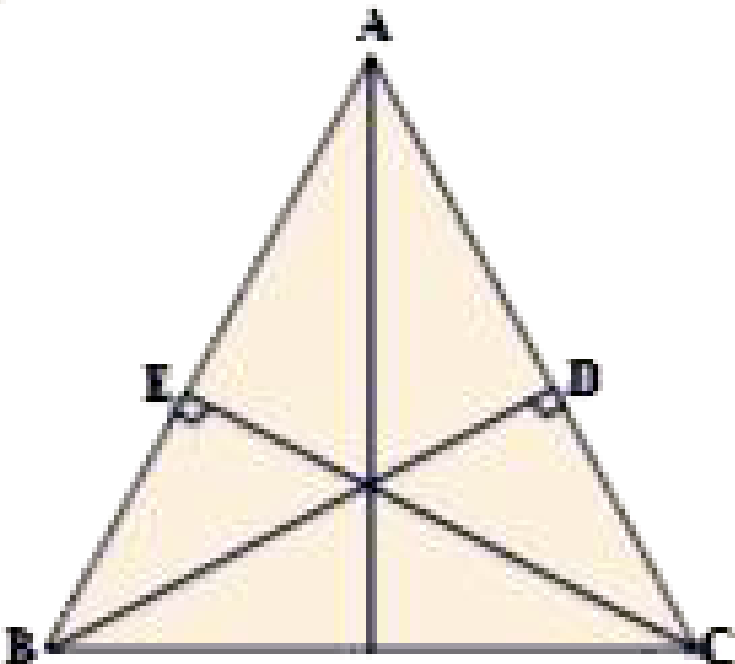
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4. ABC is a triangle in which altitudes BD and CE to sides AC and AB are equal (see figure) .

Show that

(i) $\triangle ABD \cong \triangle ACE$

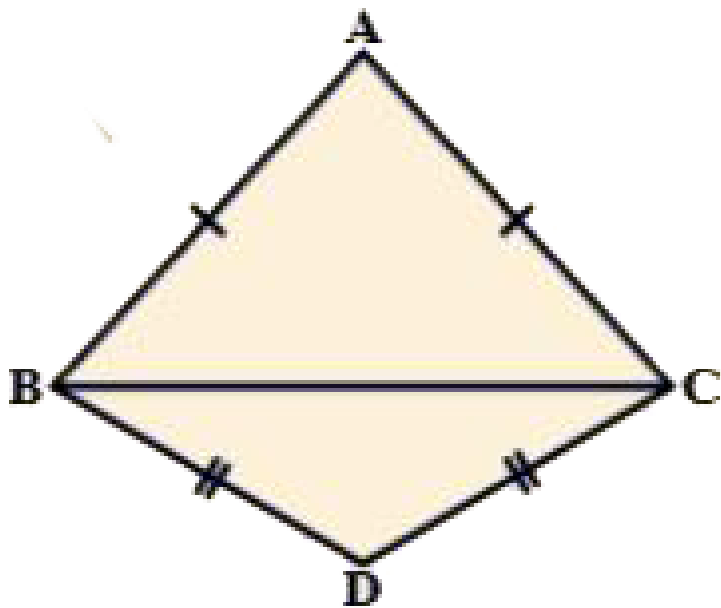
(ii) $AB = AC$ i.e., ABC is an isosceles triangle.





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5. $\triangle ABC$ and $\triangle DBC$ are two isosceles triangles on the same base BC (see figure). Show that $\angle ABD = \angle ACD$.



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Exercise 7 3

1. AD is an altitude of an isosceles triangle ABC in which $AB = AC$. Show that, (i) AD bisects BC
(ii) AD bisects $\angle A$.



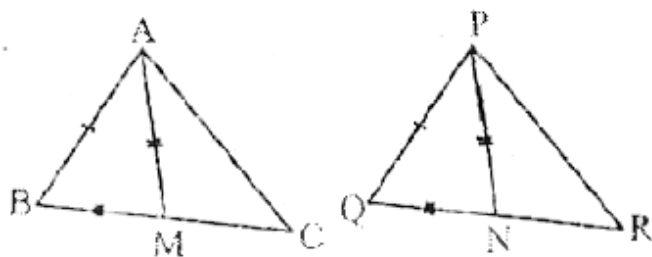
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2. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ

and QR and median PN of $\triangle PQR$. Show that

$$\triangle ABM \cong \triangle PQN$$

$$(ii) \triangle ABC \cong \triangle PQR$$



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3. 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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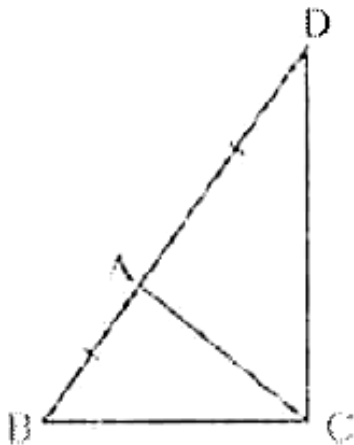
4. $\triangle ABC$ is an isosceles triangle in which $AB = AC$. Show that $\angle B = \angle C$.



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5. $\triangle ABC$ is an isosceles triangle in which $AB = AC$. Side BA is produced to D such that $AD = AB$.

Show that $\angle BCD$ is a right angle.



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6. $\triangle ABC$ is a right angled triangle in which $\angle A = 90^\circ$ and $AB = AC$. Show that $\angle B = \angle C$.



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



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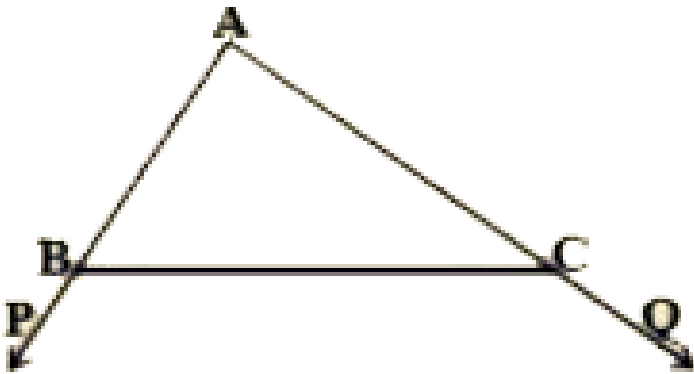
Exercise 7 4

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



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2. In adjacent figure, sides AB and AC of $\triangle ABC$ are extended to points P and Q respectively. Also, $\angle PBC < \angle QCB$. Show that $AC > AB$.

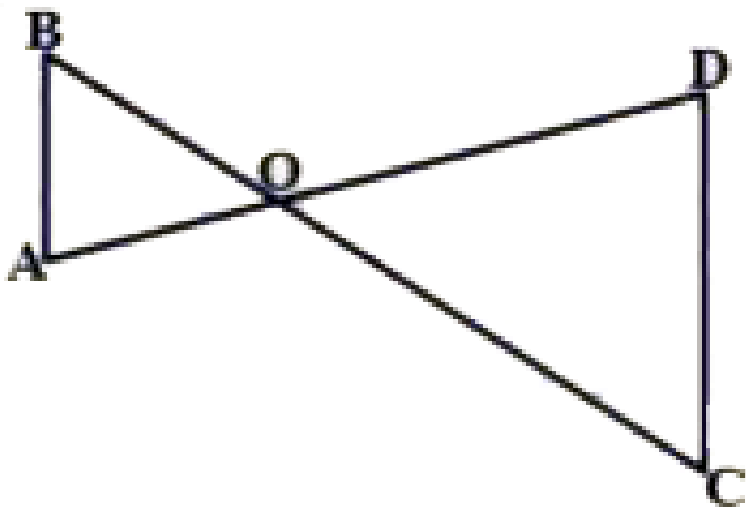


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3. In adjacent figure,

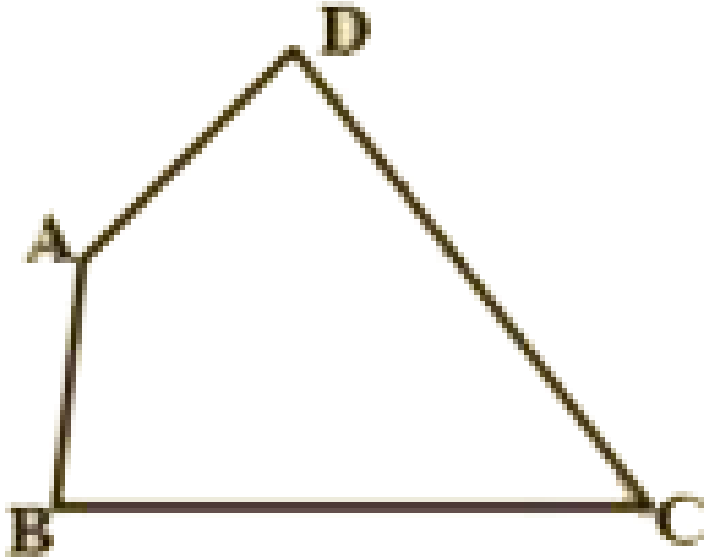
$\angle B < \angle A$ and $\angle C < \angle D$ Show that $AD <$

BC .



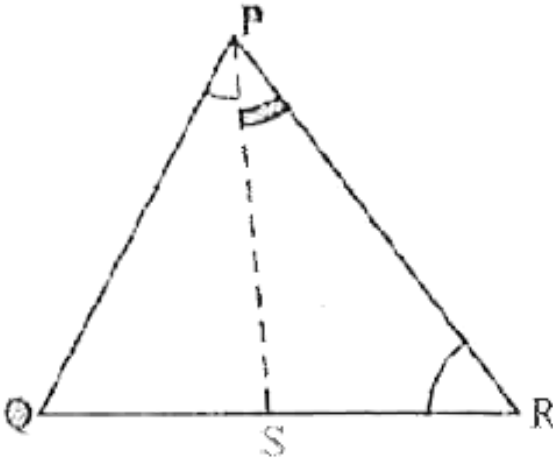
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4. AB and CD are respectively the smallest and longest sides of quadrilateral $ABCD$ (see adjacent figure). Show that $\angle A > \angle C$ and $\angle B > \angle D$.



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5. In $\triangle PQR$, $PQ > PR$ and PS bisects $\angle QPR$. Prove that $\angle PSR > \angle PSQ$



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6. If two sides of a triangle measure 4 cm and 6 cm find all possible measurements (positive integers) of the third side. How many distinct triangles can be obtained?



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7. Try to construct a triangle with 5 cm, 8 cm and 1 cm. Is it possible or not ? Why ? Give your justification?



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