



# MATHS

## BOOKS - RS AGGARWAL MATHS (HINGLISH)

### CONGRUENCE

#### Illustrative Examples

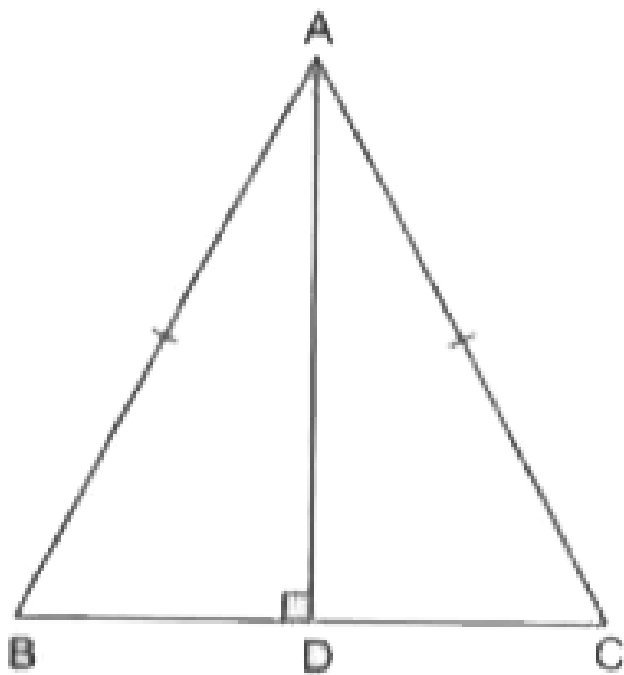
1. Without drawing the triangles, state the correspondence between the sides and the

angles of the following pairs of congruent triangles:  $ABC \cong PQR$  (b)  $ABC \cong QRP$



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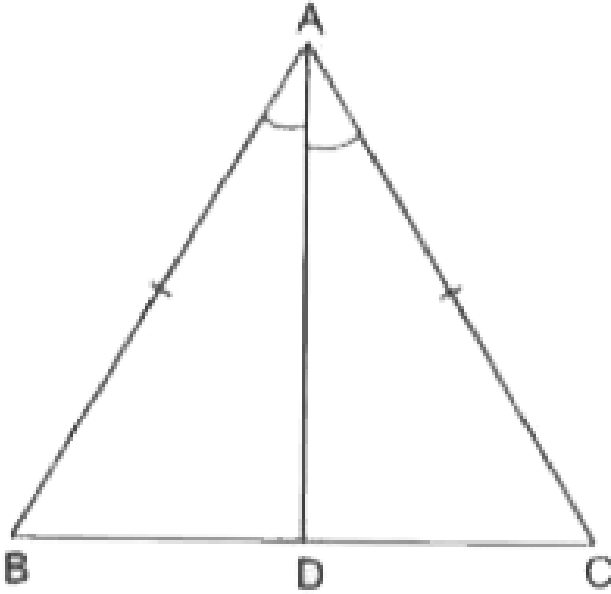
2. Show that in an isosceles triangle, the angles opposite to the equal sides are equal.



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3. Prove that the bisector of the vertical angle of an isosceles triangle bisects the base at

right angles.



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Exercise

1. State the correspondence between the vertices, sides and angles of the following pairs of congruent triangles.

Q (i)  $\triangle ABC = \triangle EFD$

(ii)  $\triangle CAB = \triangle QRP$

(iii) (i)  $\triangle XYZ = \triangle QPR$

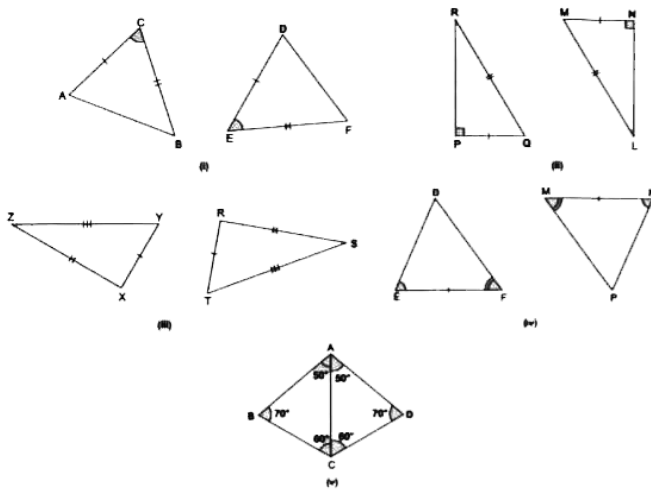
(iv)(i)  $\triangle MPN = \triangle SQR$



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2. Given below are pairs of congruent triangles. State the property of congruence and name the congruent triangles in each case.

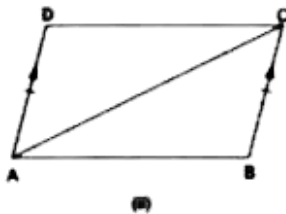
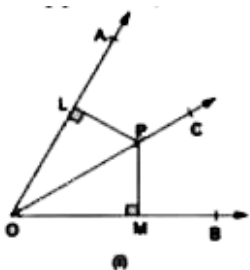
Q (i)



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3. In Fig. (i),  $PL \perp OA$  and  $PM \perp OB$  such that  $PL = PM$ . IS  $\triangle PLO = \triangle PMO$ ?

Give reasons in support of your answer.



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4. In Fig. (ii),  $AD = BC$  and  $AD \parallel BC$ . IS  $AB = DC$ ?

Give reasons in support of your answer. Hint.

Prove that  $\triangle ABC = \triangle CDA$ .



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5. In the adjoining figure,  $AB = AC$  and  $BD = DC$ .

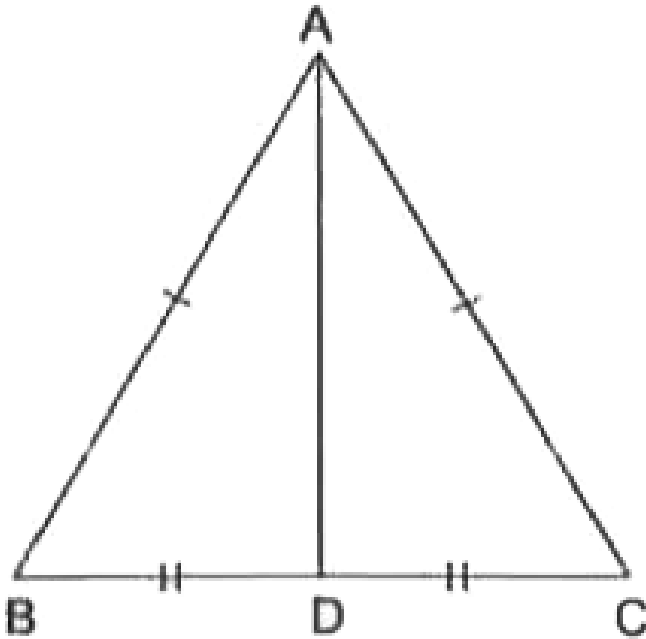
Prove that  $\triangle ADB = \triangle ADC$  and hence

show that

$$(i) \quad \angle ADB = \angle ADC = 90^\circ, \quad (ii)$$



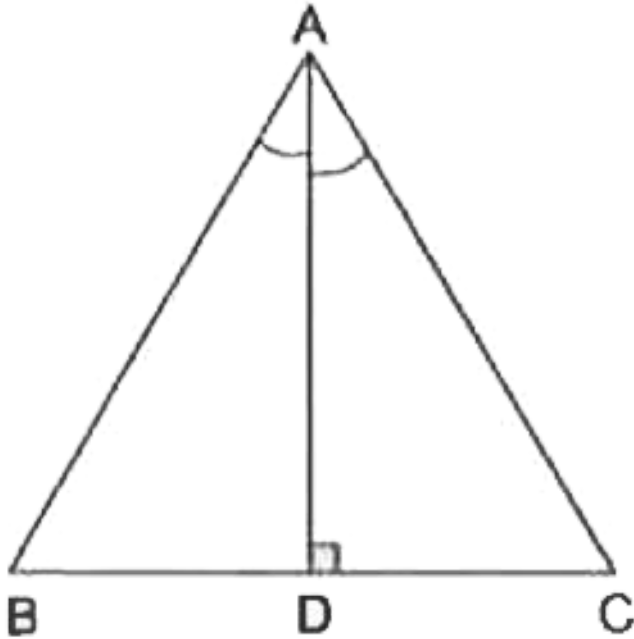
$$\angle BAD = \angle CAD.$$



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6. In the adjoining figure,  $ABC$  is a triangle in which  $AD$  is the bisector of  $\angle A$ . If  $AD \perp BC$ ,

show that  $\triangle ABC$  is isosceles.

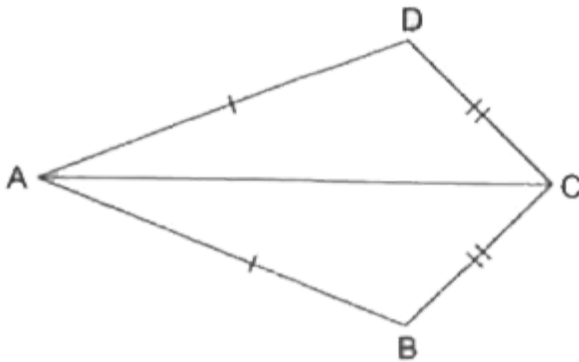


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7. In the adjoining figure,

$AB = AD$  and  $CB = CD$ .

Is  $\triangle ABC \cong \triangle ADC$ ?,



A. *No*

B. *Yes*

C. Incomplete information

D. None of these

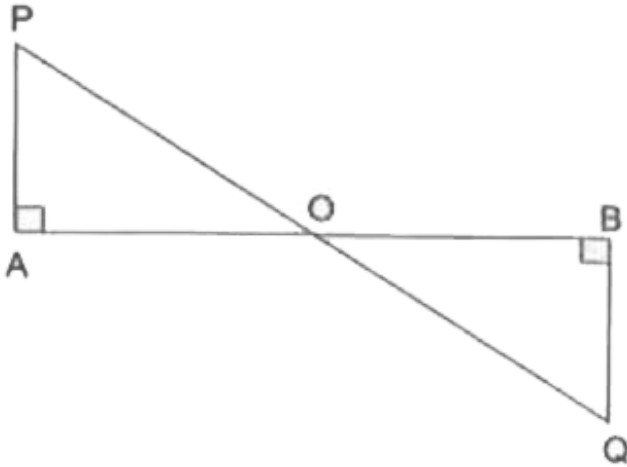
**Answer: B**



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**8.** In the given figure,  $PA \perp AB$ ,  $QB \perp AB$   
and  $PA = QB$ .

Which of the following is true?



A.  $OA = OB$

B.  $\angle P = \angle Q$

C. Both (a) and (b)

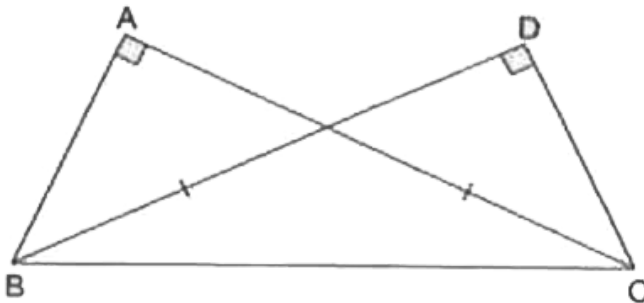
D. Cannot be determined

**Answer: C**



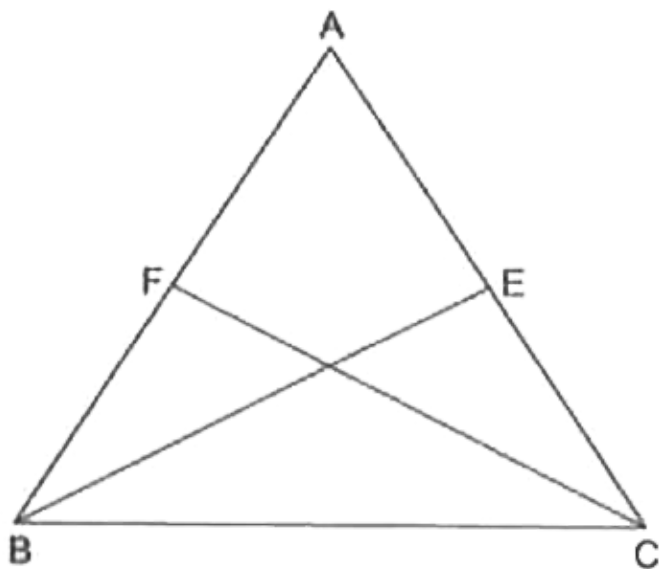
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9. In the given figure, triangles  $ABC$  and  $DCB$  are right angled at  $A$  and  $D$  respectively and  $AC = DB$ . Prove that  $\triangle ABC = \triangle DCB$ .



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10. In the adjoining figure,  $\triangle ABC$  is an isosceles triangle in which  $AB = AC$ . If  $E$  and  $F$  be the midpoints of  $AC$  and  $AB$  respectively, prove that  $BE = CF$ . Hint. Show that  $\triangle BCF = \triangle CBE$ .

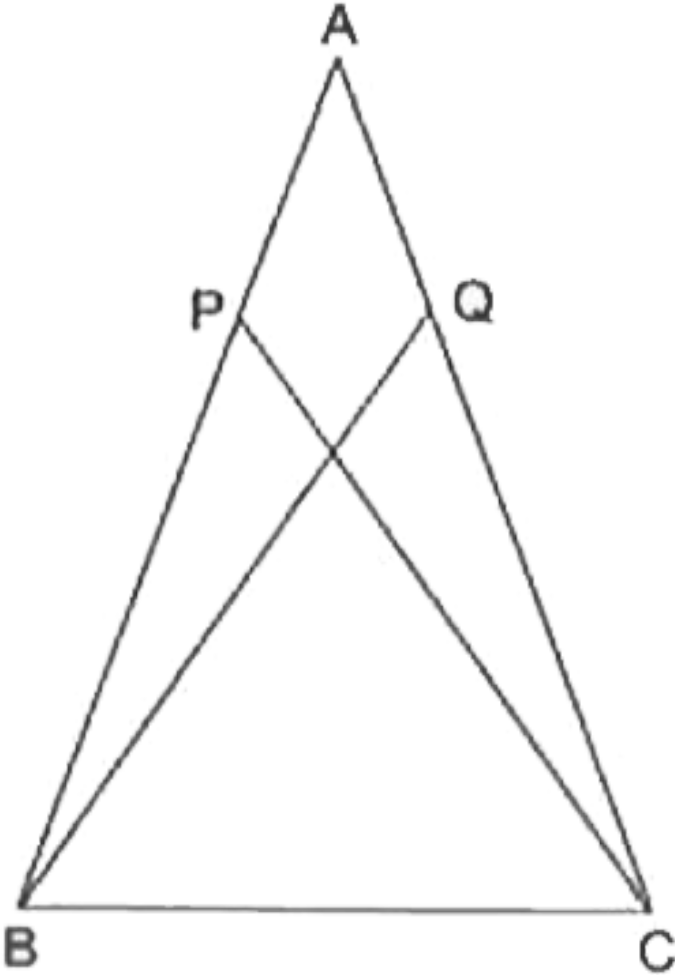


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**11.** In the adjoining figure, P and Q are two points on equal sides AB and AC of an isosceles triangle ABC such that  $AP = AQ$ . Prove

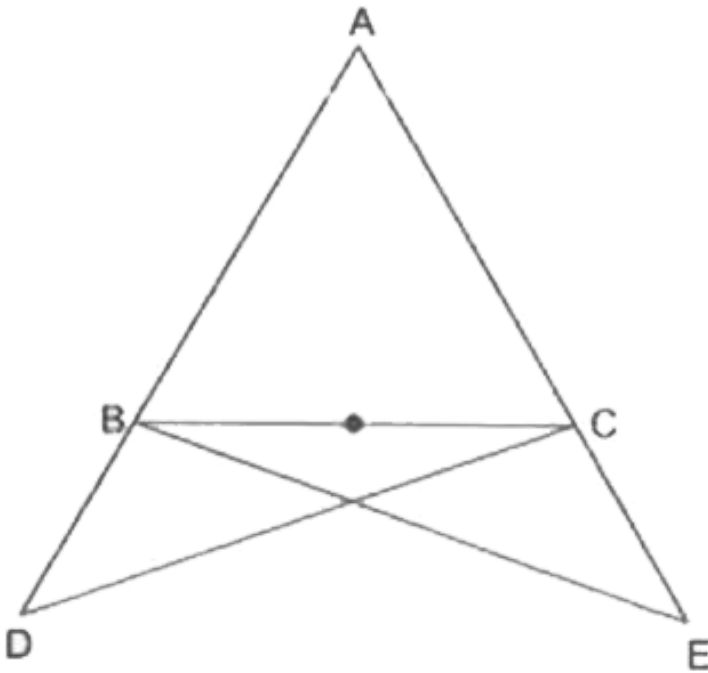


that  $BQ = CP$ .



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12. In the given figure,  $\triangle ABC$  is an isosceles triangle in which  $AB = AC$ . If  $AB$  and  $AC$  are produced to  $D$  and  $E$  respectively such that  $BD = CE$ , prove that  $BE = CD$ . Hint. Show that  $\triangle ACD = \triangle ABE$ .



**13.** In the adjoining figure,  $ABC$  is an isosceles triangle in which  $AB = AC$ . Also,  $D$  is a point such that  $BD = CD$ . Prove that  $AD$  bisects  $\angle A$  and  $\angle D$



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**14.** If two triangles have their corresponding angles equal, are they always congruent? If not, draw two triangles which are not

congruent but which have their corresponding angles equal



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**15.** Are two triangles congruent if two sides and an angle of one triangle are respectively equal to two sides and an angle of the other? If not then under what conditions will they be congruent?



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16. Draw  $\triangle ABC$  and  $\triangle PQR$  such that they are equal in area but not congruent.



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17. Fill in the blanks:

Q (i) Two line segments are congruent if they have.....

(ii) Two angles are congruent if they have.....

(iii) Two squares are congruent if they have.....

(iv) Two circles are congruent if they have.....

(v) Two rectangles are congruent if they have.....

(vi) Two triangles are congruent if they have.....



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**18.** Which of the following statements are true and which of them are false?

(i) All squares are congruent.

(ii) If two squares have equal areas, they are congruent.

(iii) If two figures have equal areas, they are congruent.

(iv) If two triangles are equal in area, they are congruent.

(v) If two sides and one angle of a triangle are equal to the corresponding two sides and angle of another triangle, the triangles are congruent.

(vi) If two angles and any side of a triangle are equal to the corresponding angles and the side of another triangle then the triangles are congruent.

(vii) If three angles of a triangle are equal to

the corresponding angles of another triangle then the triangles are congruent.

(viii) If the hypotenuse and an acute angle of a right triangle are equal to the hypotenuse and the corresponding acute angle of another right triangle then the triangles are congruent.

(ix) If the hypotenuse of a right triangle is equal to the hypotenuse of another right triangle then the triangles are congruent.



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