MATHS

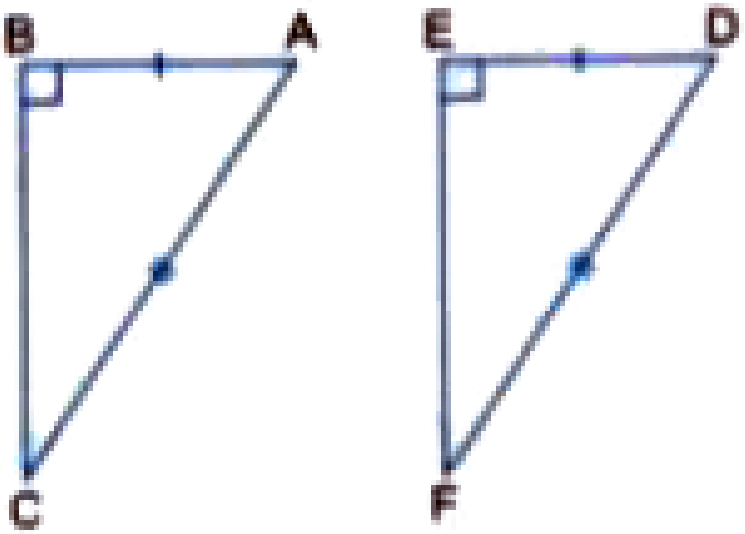
BOOKS - ICSE

CONGRUENCE

Solved Examples

1. State the condition (SSS or SAS or ASA or RHS) under which $\Delta ABC \cong \Delta DEF$ in each

of the following cases :



A. SSS

B. SAS

C. ASA

D. RHS

Answer: D

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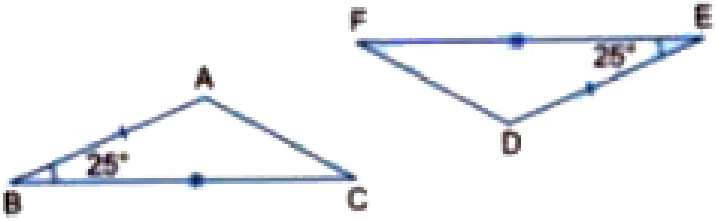
2. State the condition (SSS or SAS or ASA or RHS) under which $\Delta ABC \cong \Delta DEF$ in each of the following cases :



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3. If $\Delta ABC \cong \Delta YZX$, write the pairs of correponding equal angles and sides of the two triangles.

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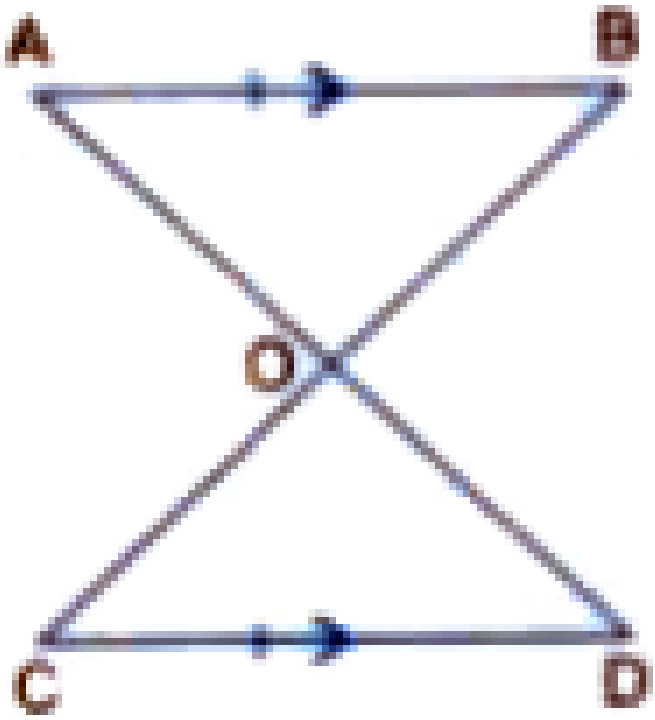
4. In the given figure, $AB \mid\mid CD$ and $AB = CD$, prove that: $\Delta AOB \cong \Delta DOC$



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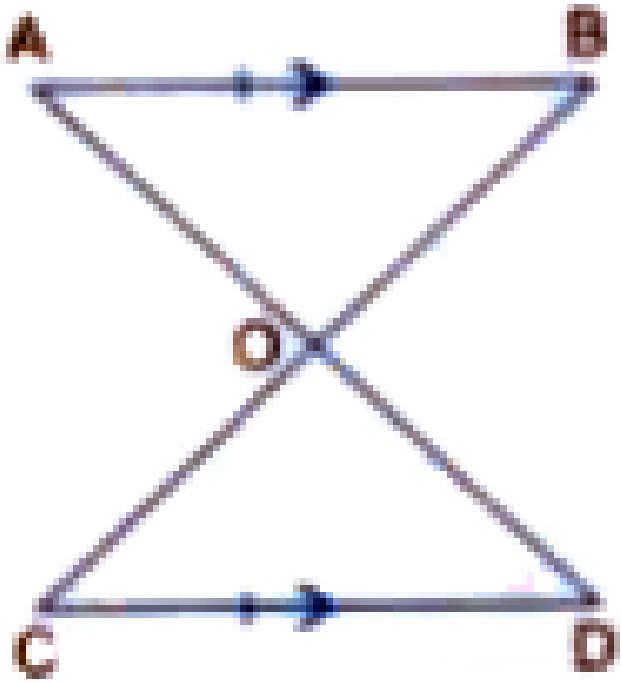
5. In the given figure, $AB \parallel CD$ and $AB = CD$, prove that:



triangle

AOB is congruent to triangle DOC.

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6. In an isosceles triangle, prove that the angles opposite to equal sides are equal.

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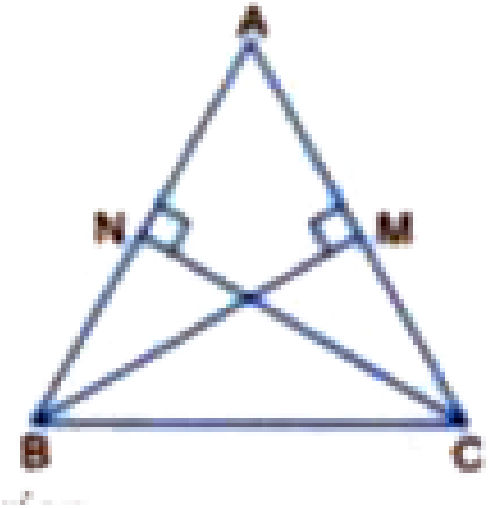
7. In the adjoining figure, BM and CN are the altitudes drawn to the sides AC and AB respectively of ΔABC. If BM=CN, prove that

ΔABC is isosceles.



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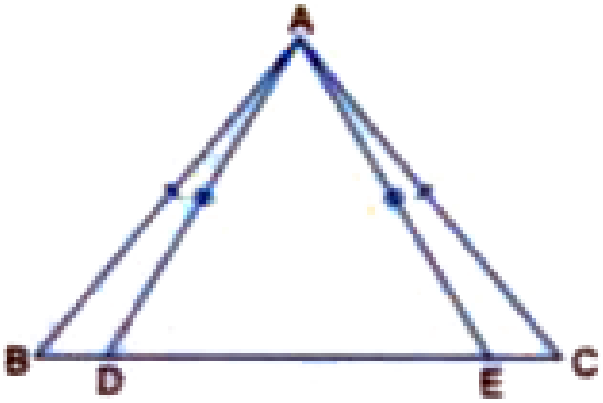
8. In the given figure AB=AC and AD=AE. Prove that (i) $\Delta ABD \cong \Delta ACE$ and (ii) BE=DC



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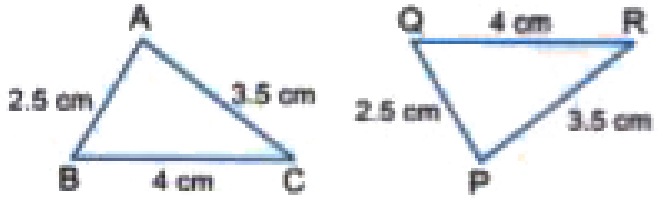
Exercise 21

1. State the condition (SSS or SAS or ASA or RHS) under which $\Delta ABC \cong \Delta PQR$ in each

of the folloiwng cases.



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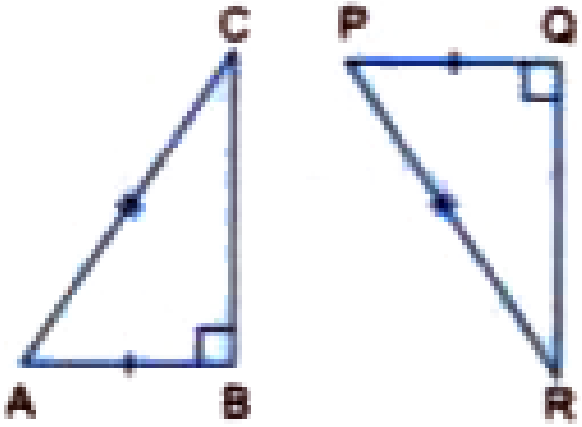
2. State the condition (SSS or SAS or ASA or RHS) under which $\Delta ABC \cong \Delta PQR$ in each

of the folloiwng cases.



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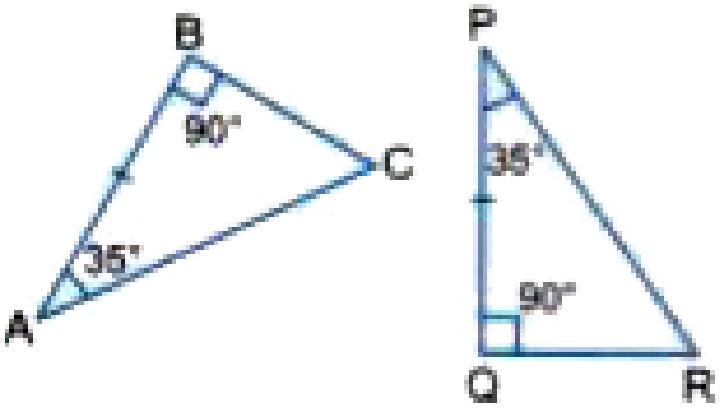
3. State the condition (SSS or SAS or ASA or RHS) under which $\Delta ABC \cong \Delta PQR$ in each

of the folloiwng cases.



A. SSS

B. SAS

C. ASA

D. RHS

Answer: C

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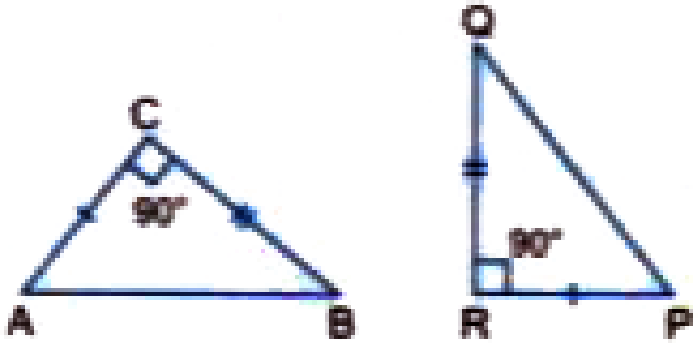
4. State the condition (SSS or SAS or ASA or RHS) under which $\Delta ABC \cong \Delta PQR$ in each of the folloiwng cases.



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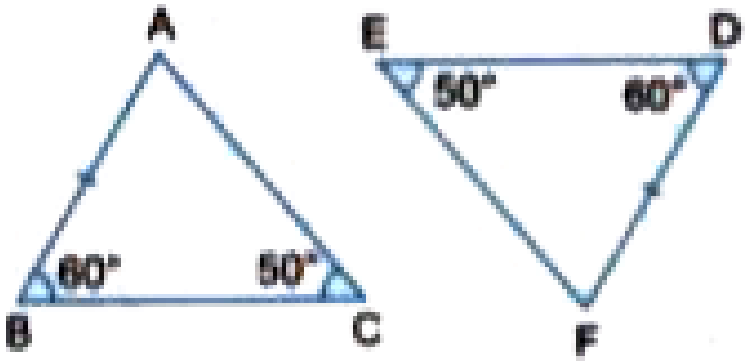
5. State giving reasons, which of the following are pairs of congruent triangles. Write down the names of triangles with congruent sign in each case, wherever they are congruent.



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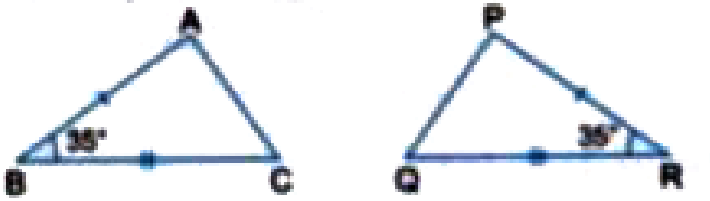
6. State giving reasons, which of the following are pairs of congruent triangles. Write down the names of triangles with congruent sign in each case, wherever they are congruent.



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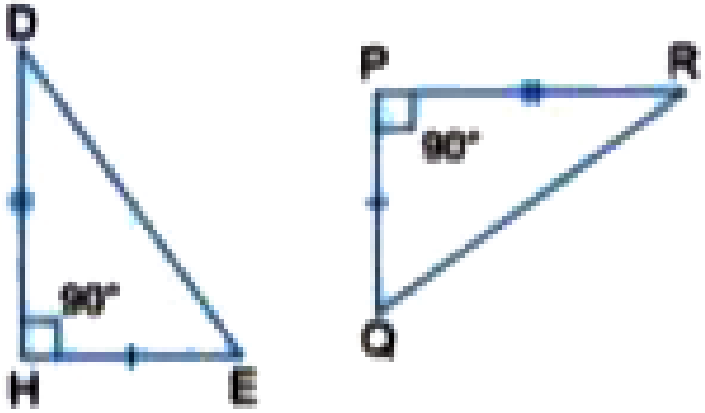
7. State giving reasons, which of the following are pairs of congruent triangles. Write down

the names of triangles with congruent sign in each case, wherever they are congruent.



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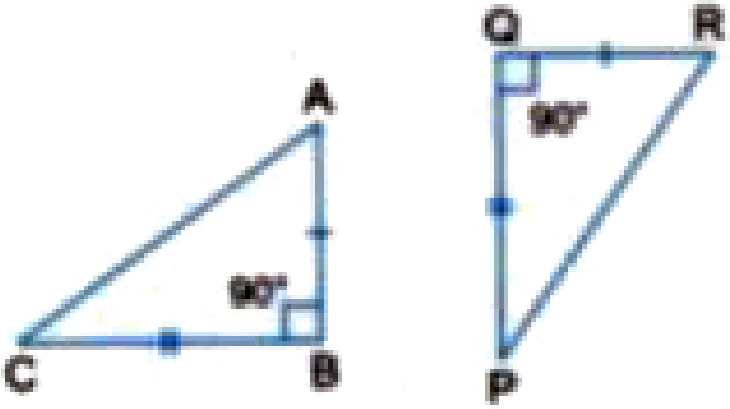
8. State giving reasons, which of the following are pairs of congruent triangles. Write down the names of triangles with congruent sign in

each case, wherever they are congruent.



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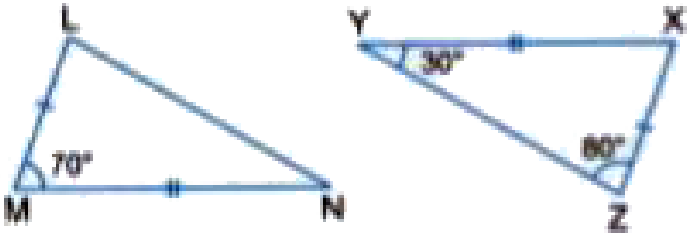
9. State giving reasons, which of the following are pairs of congruent triangles. Write down the names of triangles with congruent sign in

each case, wherever they are congruent.



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10. State giving reasons, whether the following pairs of triangles are congruent or not: ΔABC in which $\angle A = 50^\circ, \angle B = 60^\circ, BC = 4.5$ cm and ΔDEFo in which $\angle E = 60^\circ, EF = 4.5cm, \angle F = 70^\circ$

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11. State giving reasons, whether the following pairs of triangles are congruent or not: ΔDEF in which $\angle E = 48^\circ, DE = 6cm, EF = 8cm$ and ΔMNR in which $\angle R = 48^\circ, MN = 6cm, MR = 8cm$

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12. State giving reasons, whether the following pairs of triangles are congruent or not: ΔKLM in which KM=4 cm $\angle K = 75^\circ, \angle M = 40^\circ$ and ΔPQR in which PR=4 cm, $\angle Q = 65^\circ, \angle R = 40^\circ$.

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13. State giving reasons, whether the following pairs of triangles are congruent or not: ΔABC in which AB=3 cm $\angle A = 90^\circ$, BC=5 cm

and ΔKLM in which KM=3 cm $\angle K = 90^\circ$ cm,

1,M=5cm

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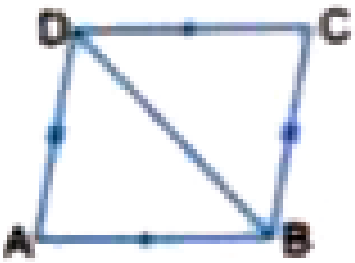
14. In the given figure, AB=CD and AD=CB. Prove that :

(i) $\Delta ABD = \Delta CDB$

(ii) $\angle A = \angle C$



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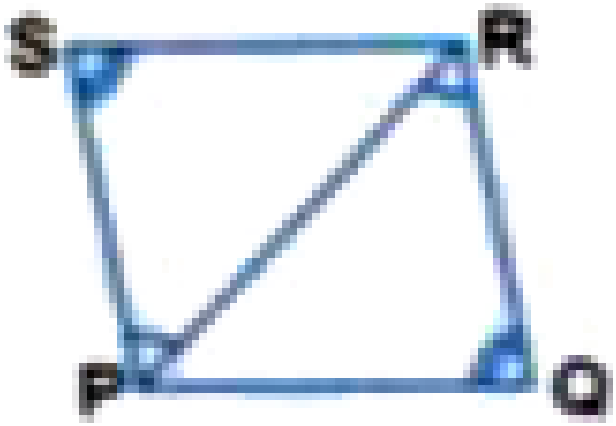
15. In the given figure, $\angle SPR = \angle QRP$ and $\angle RSP = \angle PQR$. Prove that :

(i) PQ=RS

(ii) PS=QR



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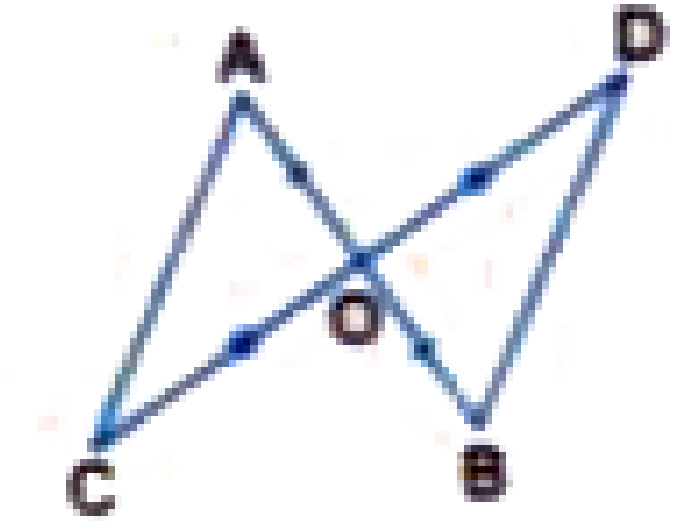
16. In the given figure we have AO=BO and CO=DO. Prove that :

(i) $\Delta AOC \cong \Delta BOD$

AC=BD



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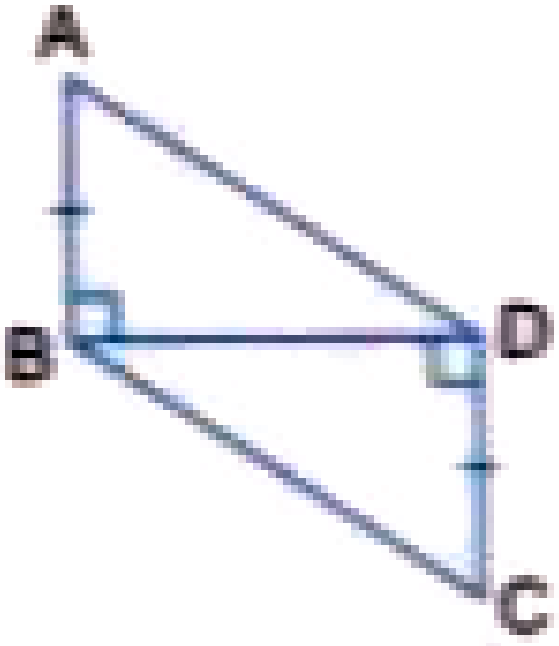
17. In the given figure, $AB \perp BD, CD \perp BD$ and AB=CD. Prove that :

(i) $\Delta ABD \cong \Delta CDB$

(ii) AD-CB



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18. In the given figure, $PL \perp OA$ and $PM \perp OB$ such that OL=OM. Prove that :

(i) $\Delta OLP \cong \Delta OMP$

(ii) PL=PM

$\angle LOP = \angle MOP$

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19. In the given figure, we have PQ=SR and PR=SQ. Prove that :

(i) $\Delta PQR \cong \Delta SRQ$

(ii) $\angle PQR = \angle SRQ$

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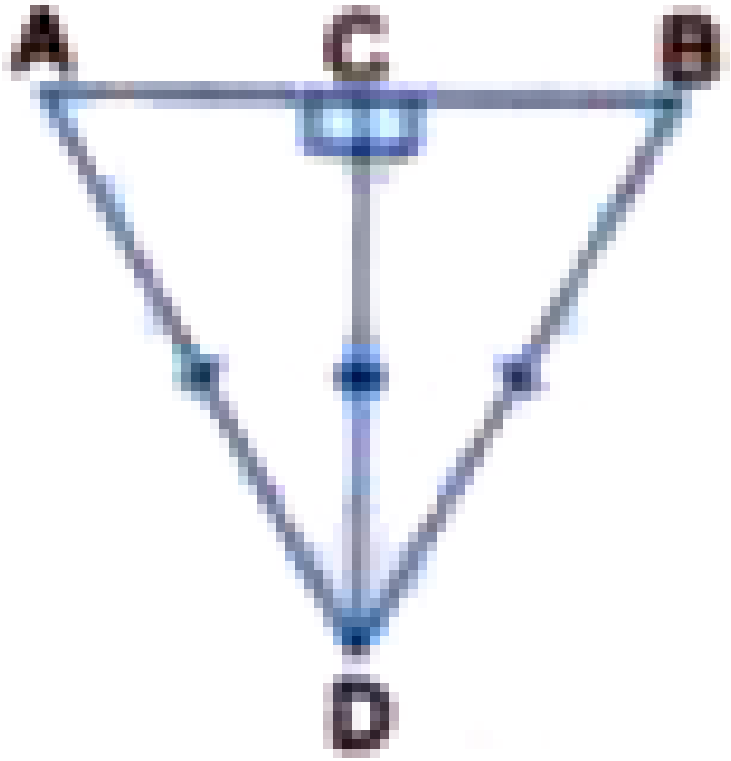
20. In the given figure, we have $AC \perp CD$, $BC \perp CD$ and DA=DB. Prove that : CA=CB.



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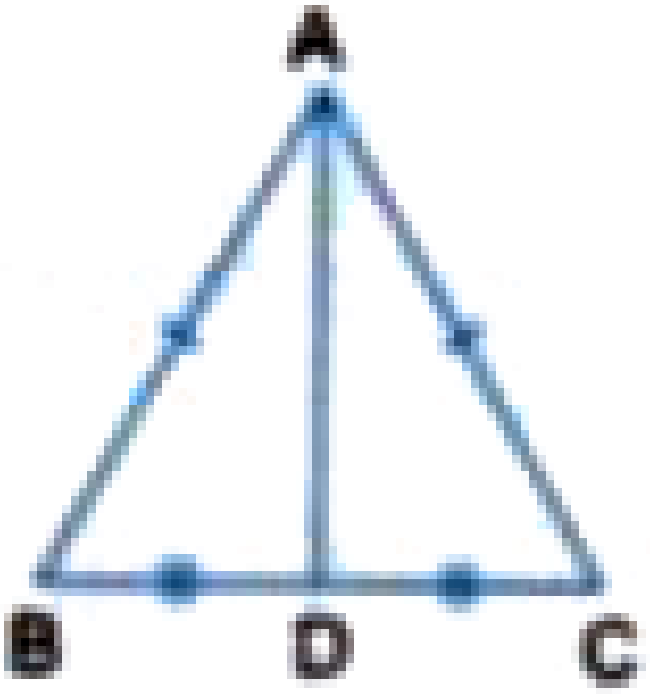
21. In the adjoining figure, ΔABC is an isosceles triangles in which AB=AC and AD is a median. Prove that :

(i) $\Delta ADB \cong \Delta ADC$

(ii) $\angle BAD = \angle CAD$



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22. In the adjoining figure, ΔABC is an isosceles triangles in which AB=AC and AD is

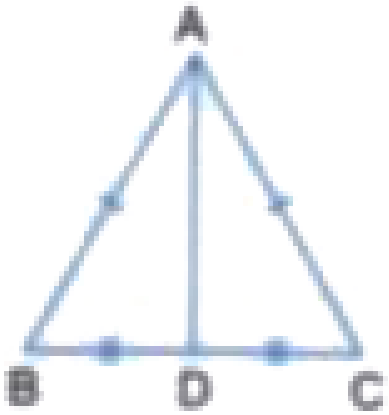
the bisector of $\angle A$. Prove that :

(i) $\Delta ADB \cong \Delta ADC$

(ii) $\angle B = \angle C$

(iii) BD=DC

(iv) $AD \perp BC$



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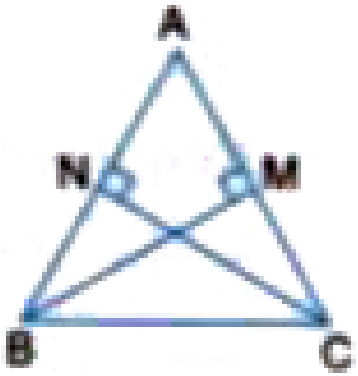
23. In the adjoining figure, ΔABC is an isosceles triangle in which AB=AC. If $BM \perp AC$ and $CN \perp AB$, prove that :

(i) $\Delta BMC \cong \Delta CNB$

(ii) BM=CN



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Example

1. In the given figure, $\angle 1 = \angle 2$ and $\angle AOB = 90^\circ$ find the angle congruet to $\angle BOC$.

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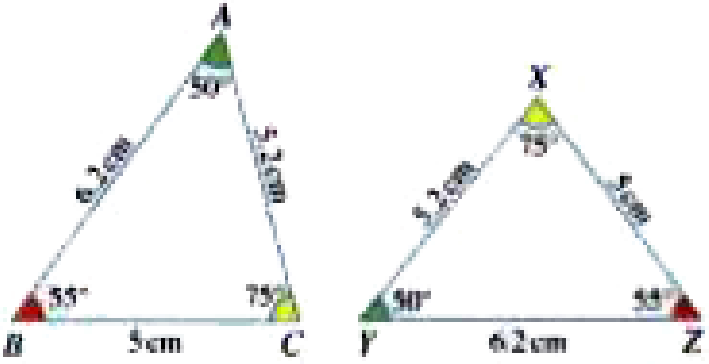
2. If the following two triangle are congruent, then state the congruence in symbolic from.



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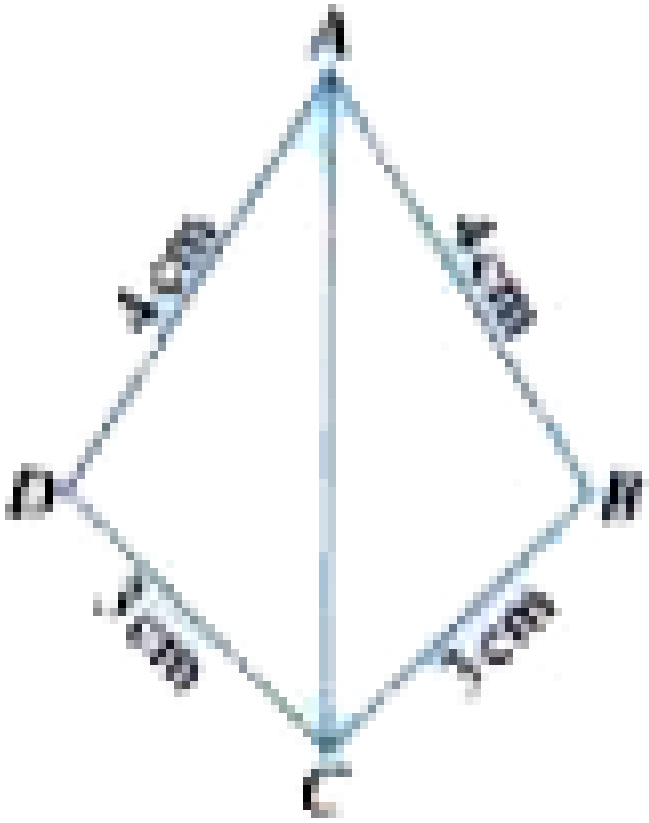
3. Find the criterion which makes △ ADC and △ ABC congruent?



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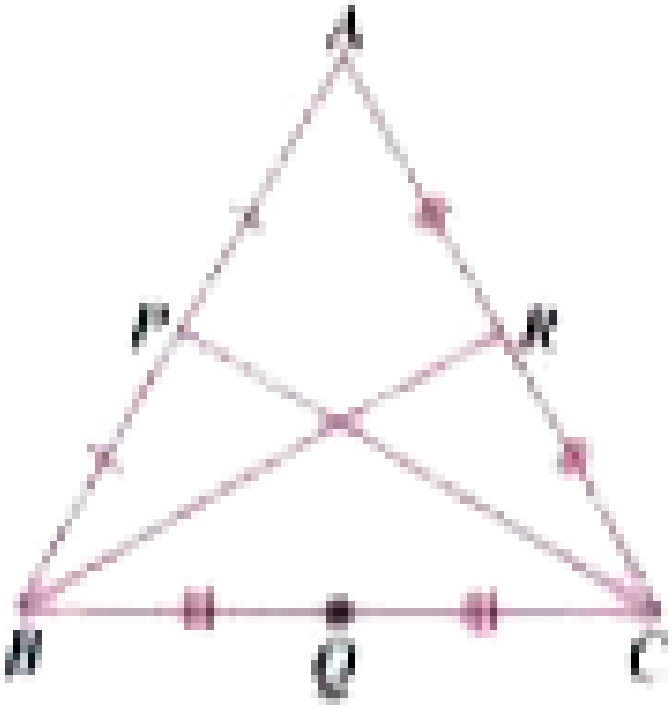
4. $\triangle ABC$ is an isosceles triangle with side AB=AC. P,Q and R are the midpoints of AB,BC and CA, respectively. What is the congruence condition that proves $\triangle RBC \cong \triangle PCB$?



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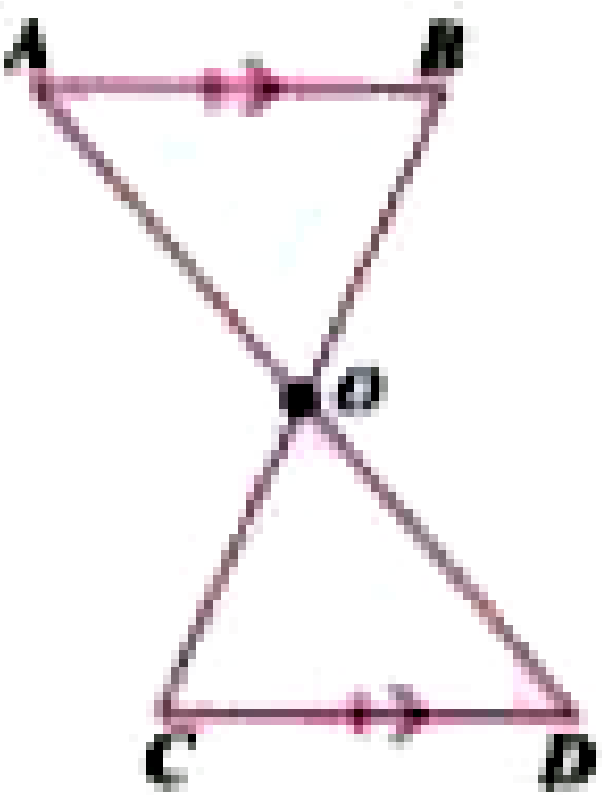
5. Given that in the figure, AB||CD and AB=CD where AD and BC intersect at point O. What is the congruence condition that proves

$\triangle OAB \cong \triangle ODC$?



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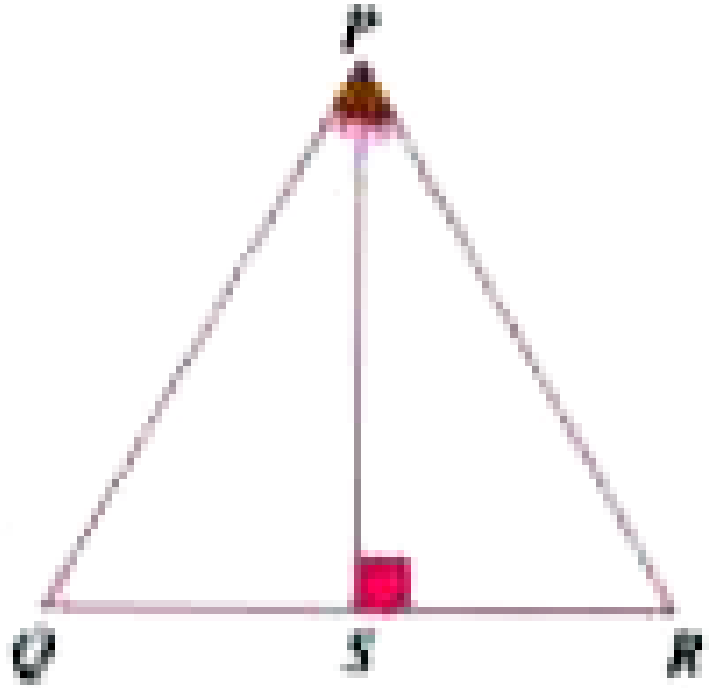
6. In the given $\triangle PQR$, the angle bisector PS of $\angle P$ is also the altitude from P on QR. Show that $\triangle PQS$ and $\triangle PRS$ are congruent.



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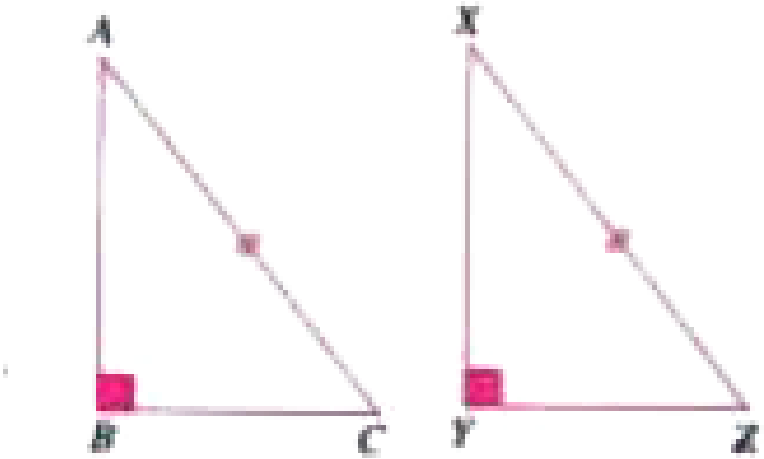
7. Two right-triangle are such that their hypotenuse are equal, and one of the acute angle are also equal.Are the two triangle congruent?



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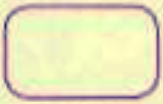
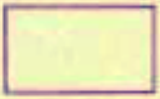
Exercise 13 1

1. Match the pair of congruent figures from the two sets of figures given below.

	Column 1		Column 2
a.		i.	
b.		ii.	
c.		iii.	
d.		iv.	
e.		v.	
f.		vi.	
g.		vii.	

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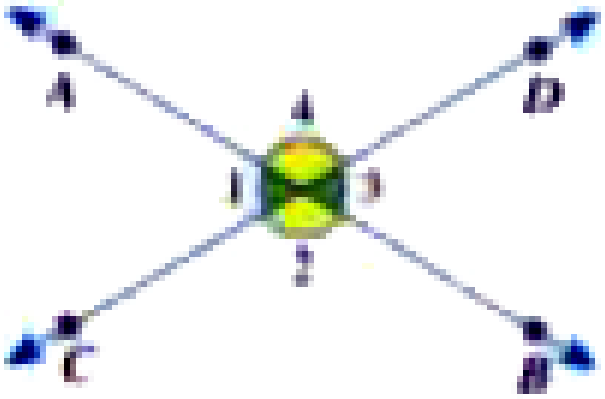
2. In the given figure, write the angles that are congruent. Explain with reasons.



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3. State true or false:

a. The corresponding angles formed by a

transversal intersecting two parallel lines are congruent.

b. Interior angles on the same side of a transversal intersecting two parallel lines are congruent.

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4. Are two circles with equal circumference congruent? Explain your answer with reasons.

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5. Are two squares with equal areas congruent? Explain your answer with reasons?

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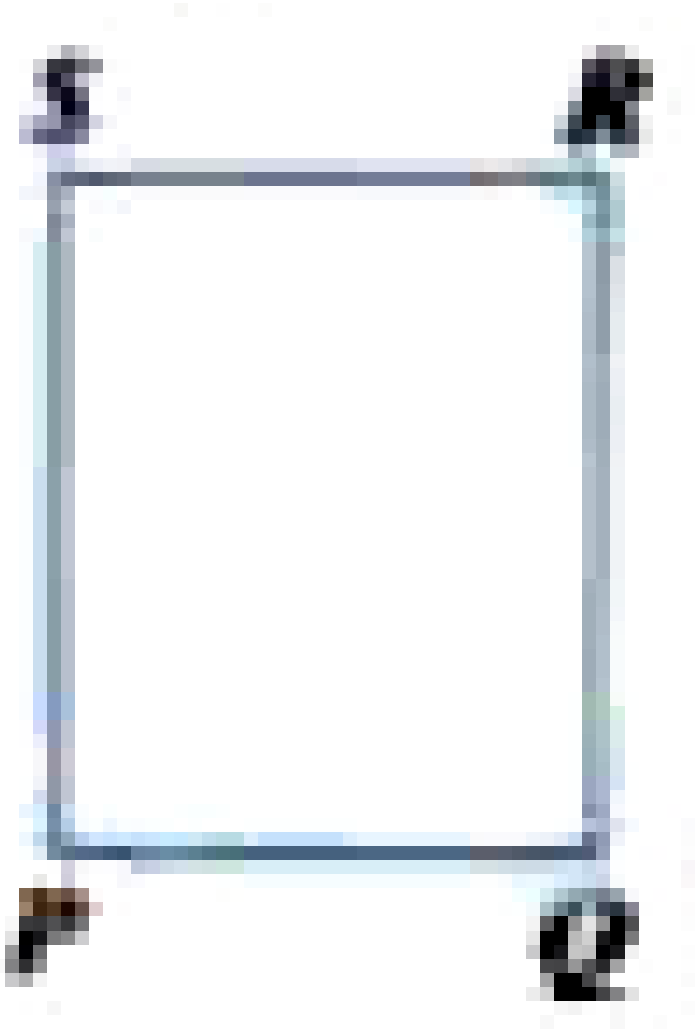
6. List the pairs of congruent sides and congruent angles in the rectangle PQRS as

shown.



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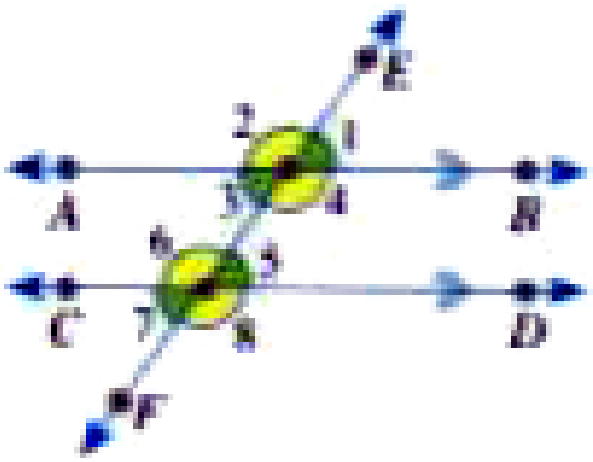
7. Identify all congruent angles in the following figure, given AB || CD.



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Exercise 13 2

1. a. Given that $\triangle MLN \cong \triangle ACB$, write down all the corresponding congruent parts of the triangles.

b. If PQ=ZY, RP=YX, $\angle P = \angle Y, then$ trianglePQR~=` _____,

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2. a. Given that $\triangle ABC \cong \triangle XYZ$, where,

$\angle B = 45^\circ$,

$\angle C = 30^\circ, \angle X = (3\mu + 15)^\circ, \angle Y = (7v + 3)^\circ$

, and

$\angle Z = (11w - 14)^\circ$. Find the correct values of

u,v,

and w.

Given that $\triangle ABC \cong \triangle XYZ$, where,

$\angle Y = (3v + 5)^\circ$. and

$\angle Z = (13w - 25)^\circ$. Choose the correct

values of u,

v, and w.

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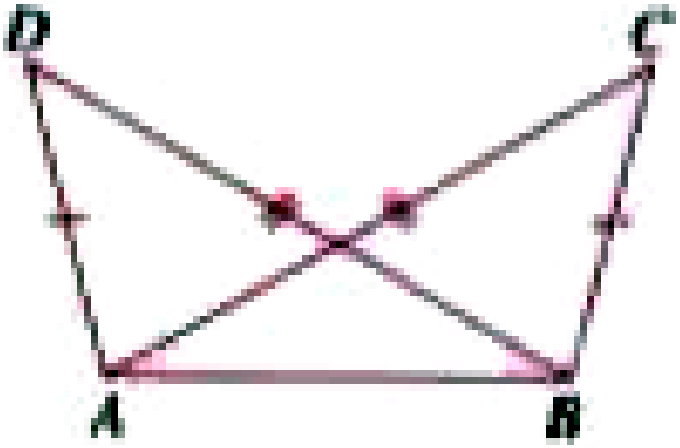
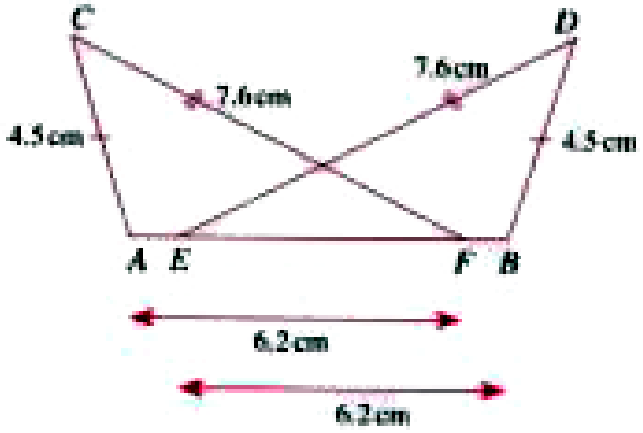
3. a. Given that $\triangle ADB \cong \triangle ACB$, are on the same base AB. Also, BD=AC and AD=BC. Which congruence condition proves that the two triangle are congruent?



b. In the given figure, which congruence

condition proves $\triangle ACF \cong \triangle BDE$?



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4. a. Show that the angles opposite to the equal sides of an isosceles triangle are equal by drawing the altitude through the vertex to the base. What congruence criterion will you

use to prove the required result?

b. Show that the angle opposite to the equal sides of an isosceles triangle are equal by drawing the angle bisectoe of the angle at vertex. What congruence criterion will you use to prove the required result?

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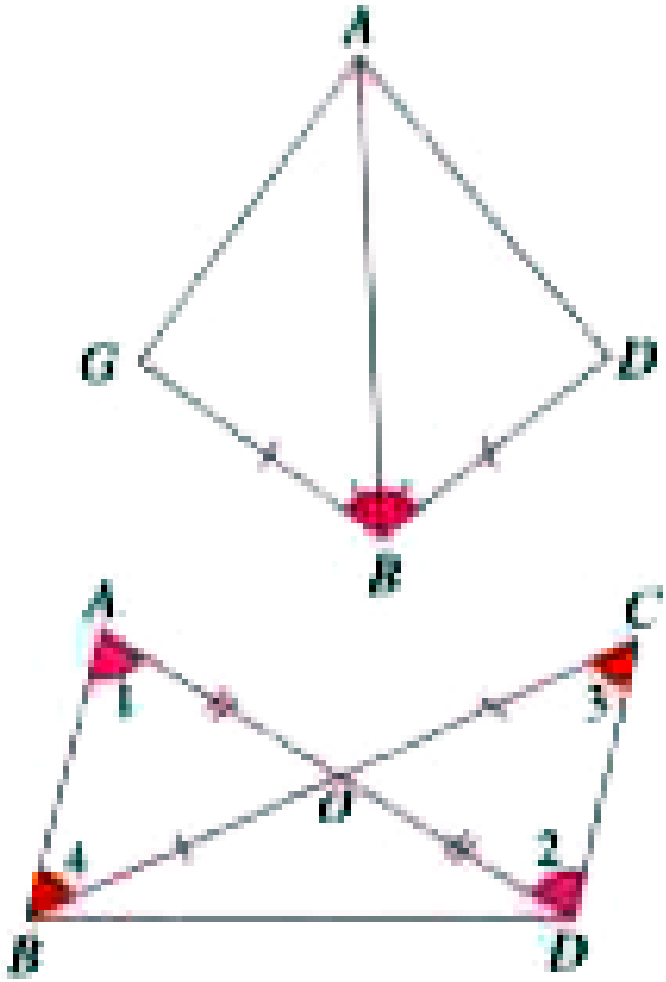
5. a. Find the criterion of congruency which makes $\triangle ABG$ and $\triangle ABD$ congruent.



b. In the given figure, 0 is the midpoint of AD and BC. Show that $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$.

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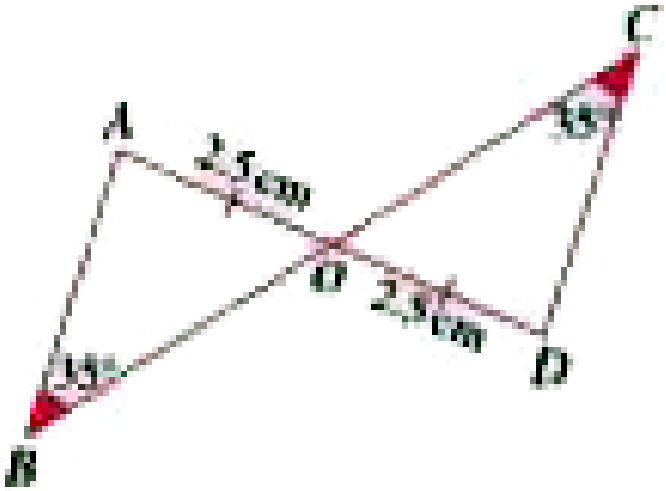
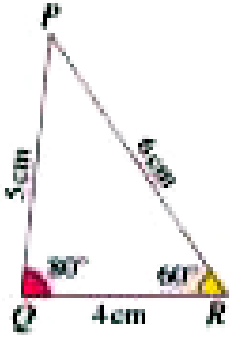
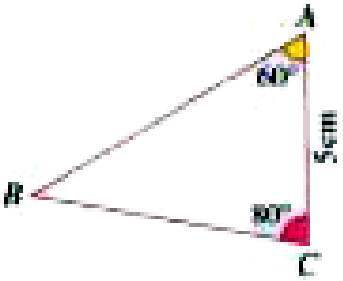
6. a. Line segment AD and BC intersect at O and AO=OD. Wich condition proves $\triangle OAB \cong ODC$?

b. Are the triangle PQR and ABC show below congruent? Why or why not?







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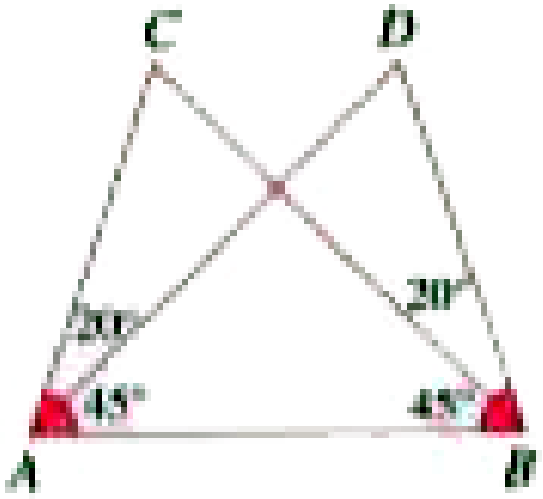
7. In the given figure, which congruence rule proves $\triangle ACB \cong \triangle BDA$?



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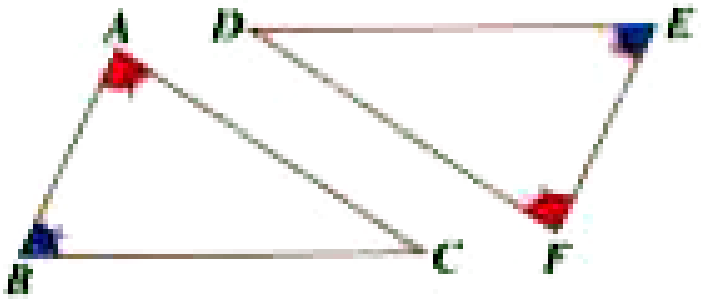
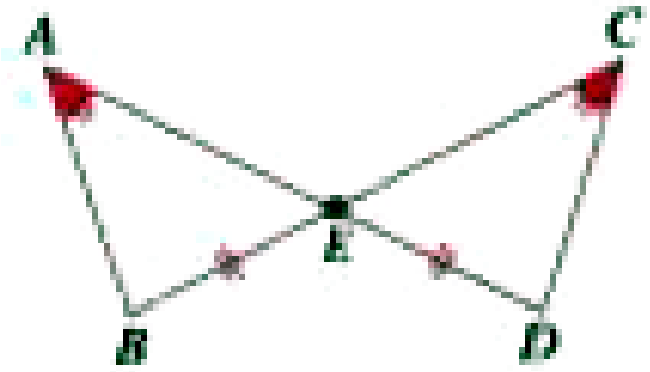
8. a. Can the given two triangle be show to be congrunt using the AAS congruence rule? If not, then what additional data is required if the congruncehas to be estblished using the AAS criterion?



b. Prove that $\triangle ABE \cong \triangle CDE$.



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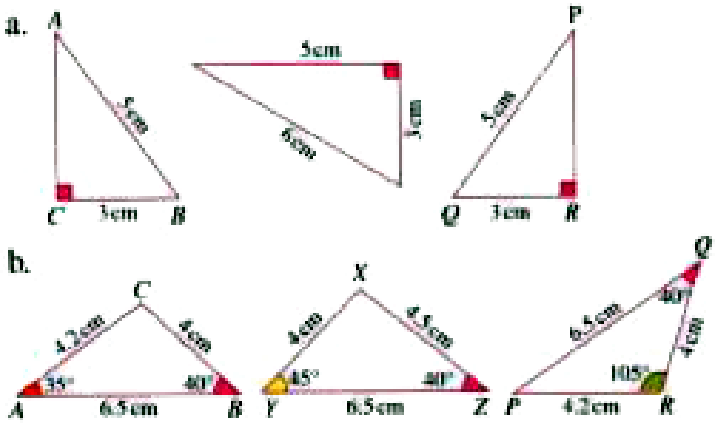
9. Identify which two triangle are congruent with the correct condition of congruency.

a.



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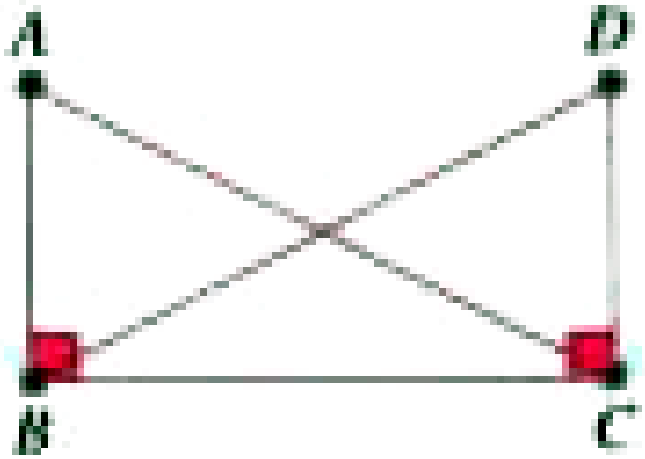
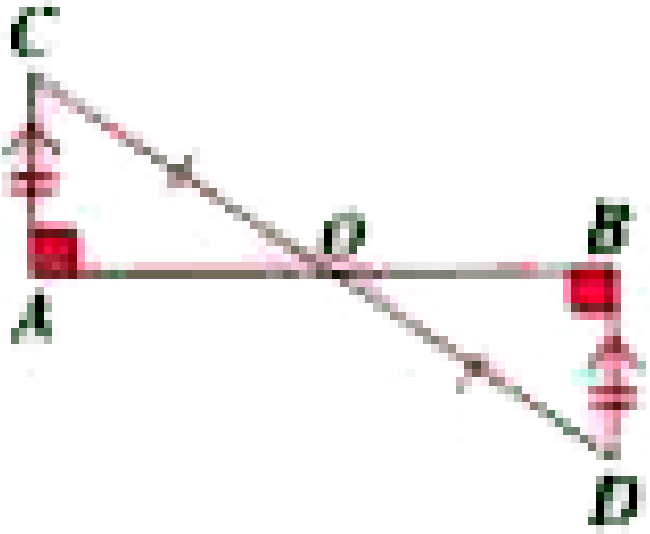
10. a. In the given figure, AC=BD. Which congrunence condition proves $\triangle CDB \cong \triangle BAC$?



b. In the given figure, AC=BD and AC||BD. Also, CO=OD and $\angle A = \angle B = 90^\circ$. How are the two triangle congruent?



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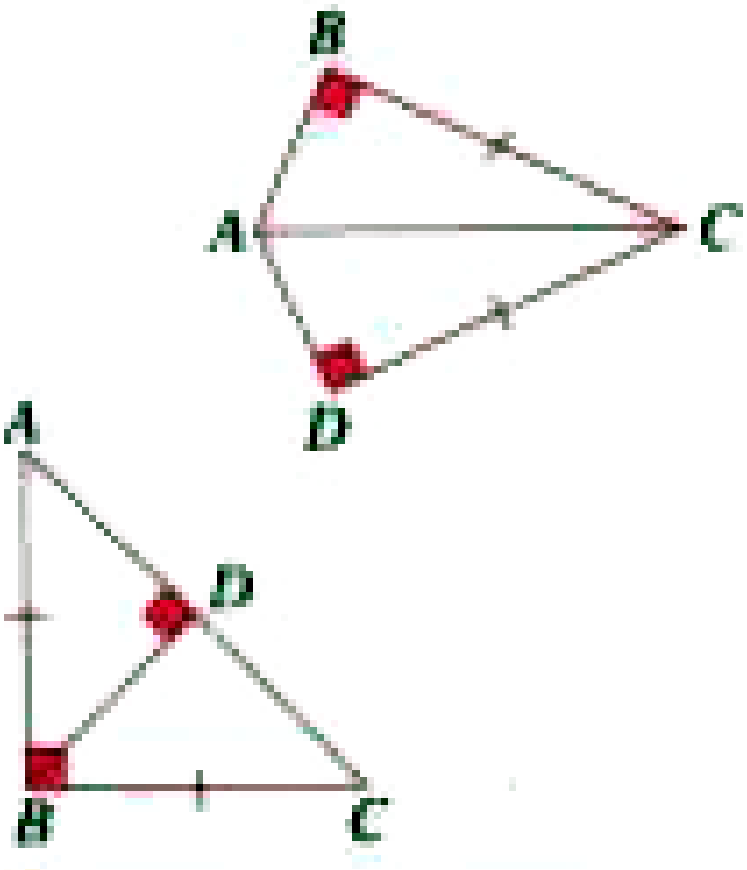
11. a. In the given figure, find the criterion which makes the two triangle congruent.

b. In the given figure, find the criterion under

which $\triangle DBA \cong \triangle dDBC$.



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Revision Exercise

1. Are two right angle congruent?

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2. Are two squares with the same perimeret congruent?

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3. Are two opposite faces of a right cylinder cingruent?

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4. Are two one-rupee conis coins congruent to a single two-rupee coin?

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5. If two triangle ABC and XYZ are such that AB=XY,BC=ZX, CA=YZ, then $\triangle ABC \cong$ ---------.

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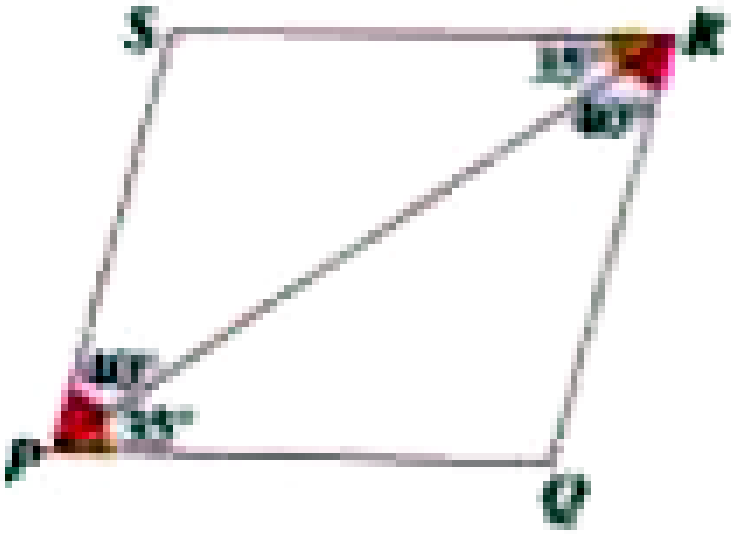
6. Establish congruency between $\triangle PRS$ and $\triangle RPQ$ in the given figure.



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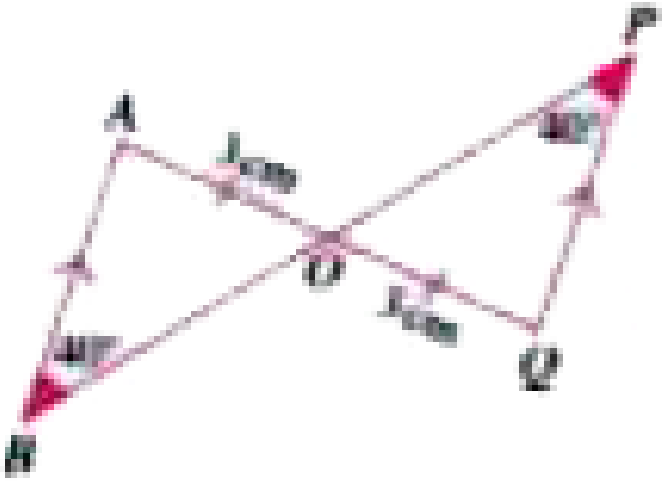
7. Line segments AB||PQ. Also, AO=OQ=3 cm Establish congruency between $\triangle AOB$ and

$\triangle QOP$.



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8. In the given figure, AB=CD where AD and BC intersect at point O and $\triangle BAO = \triangle ODC$. What is the

congrunence condition that proves $\triangle OAB \cong \triangle ODC$?

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9. Establish the congruency between the two given triangles.

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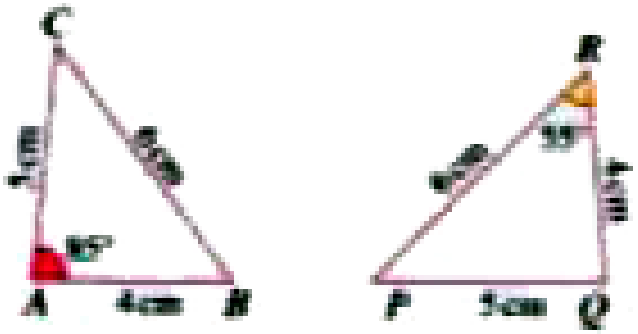
10. Identify the correct condition of congruency and the corresponding order

which makes the two triangles congruent.



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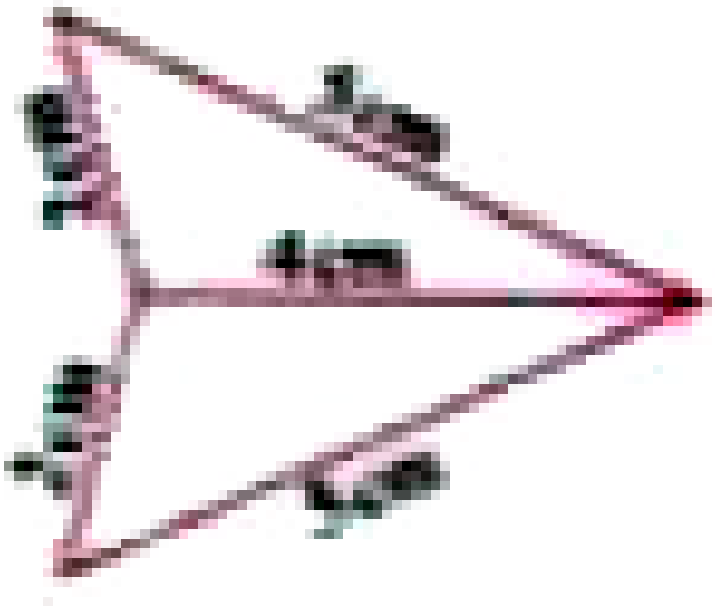
11. State the congruence criterion which makes the two triangles in the figure congruent.



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12. ABCD is a rectangle with diagonals AC and BD. Which congruence conditions(s) proves $\triangle ABD \cong \triangle CDB$?

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Try This

1. A line segment AB is trisected (divided into three equal parts) by pounts C and D .Are line segments AC,CD.DB congruent ?

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2. A circle with centre O has two distinct points A and B on its circumference Is OA $\cong$ OB > Justify your answer with reason .

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3. Are two circles with equal areas congruent ?

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4. There are two circels .One with radius 4 cm and the other with diameter 4 cm .Are the two circles congruent? Explain your answer with reasons.

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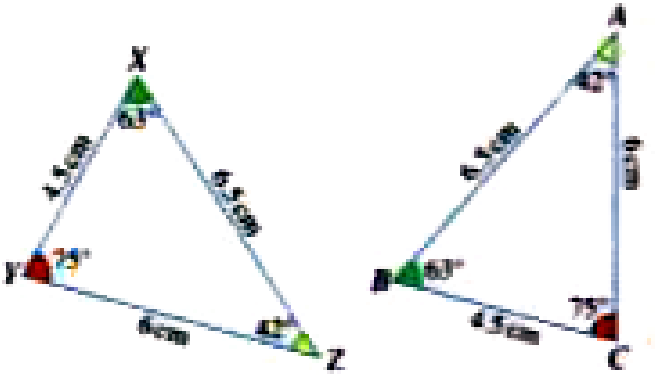
5. Identify which is the correct option for the two given triangles to be congruent .



A. $\Delta XYZ \cong \Delta ABC$

B. $\Delta BCA \cong \Delta XYZ$

C. $\Delta CAB \cong XYZ$

D. $\Delta CAB \cong \Delta XZY$

Answer: B

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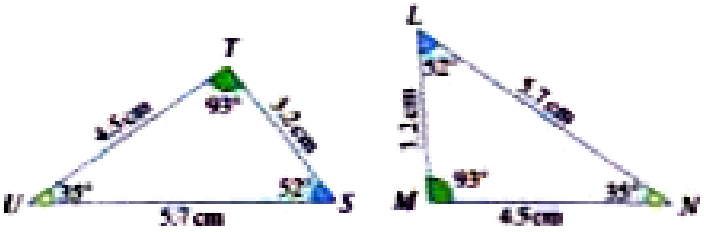
6. Are the two given triangles congruent?

Express the congruency in symbolic form .



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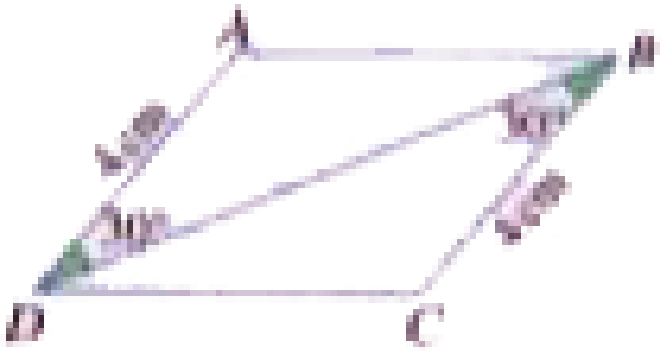
7. In quadrilateral ABCD. Show that $\angle A = \angle C$.



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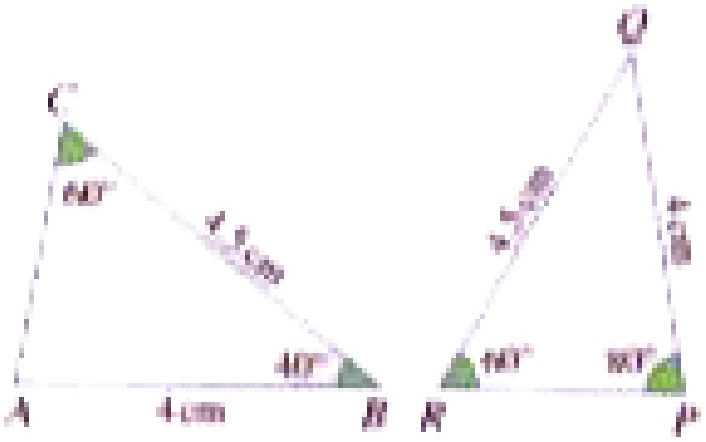
8. Show that the two given triangles are congrument .State the congruence criterion applied and write the answer in symbolic form

.



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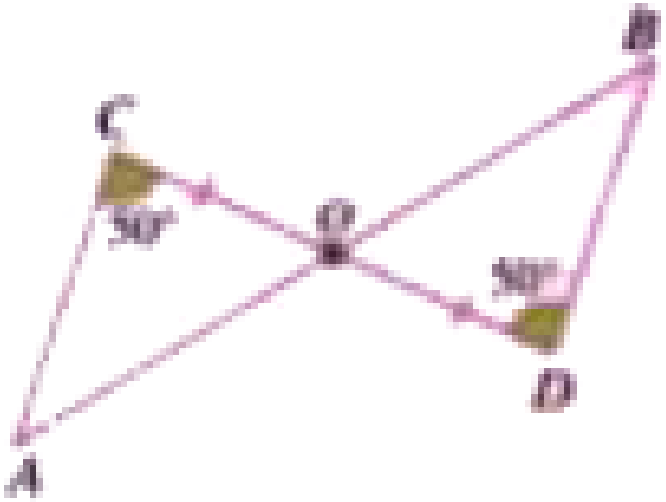
9. Line Segment AB and CD intersect at O and CO=DO.

Establish congruency between ΔCOA and

ΔDOB.



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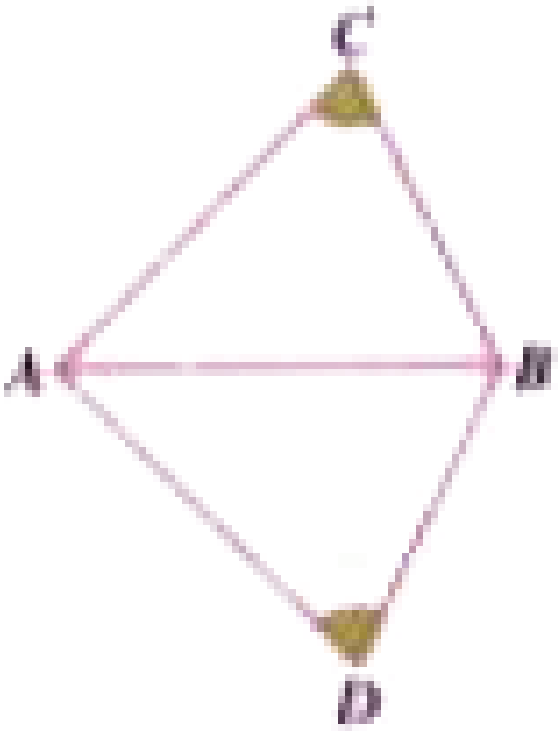
10. What more information is required to prove that $\Delta ABC \equiv \Delta ABD$. If the AAS

criterion for congruence has to be used?



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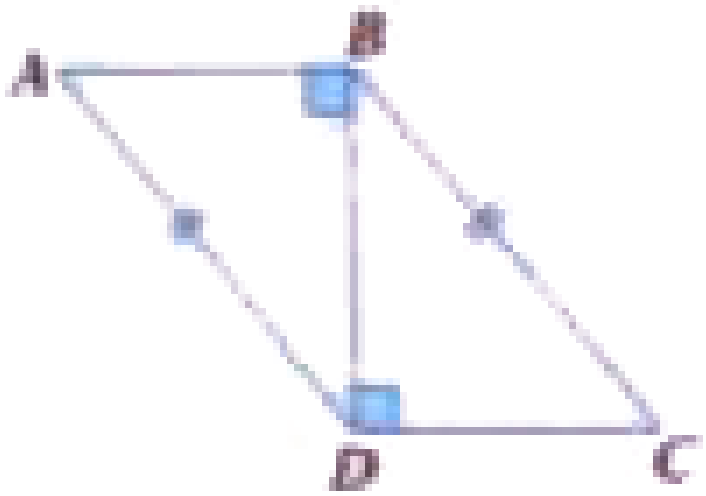
11. What criterion can be applied to show that two triangles in the figure are congruent ?



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12. Which of the following is not a valid criterion for showing two triangles congruent.

A. ASA

B. SSS

C. SAS

D. AAA

Answer:

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