doubtnut
India's Number 1 Education App

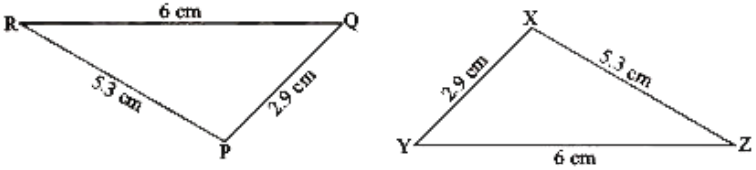
MATHS

NCERT - NCERT Maths(TELUGU)

CONGRUENCY OF TRIANGLES

Example

1. Is $\Delta PQR \cong \Delta XYZ$? Also, write the corresponding angles of the two triangles.



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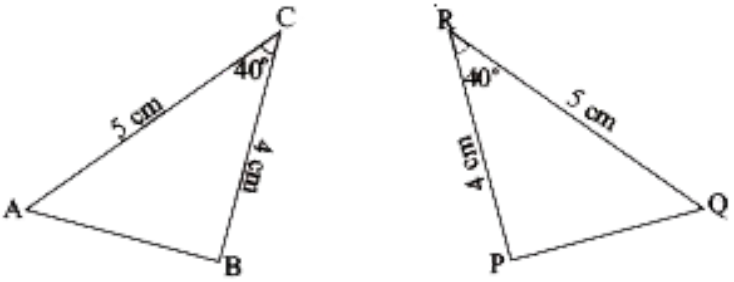
2. See the measurements of the triangles given below. Are the triangles congruent? Which are the corresponding vertices and angles?



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3. In ΔPQR, $PQ = PR$ and PS is angle bisector of $\angle P$. Are ΔPQS and ΔPRS congruent? If yes, give reason.

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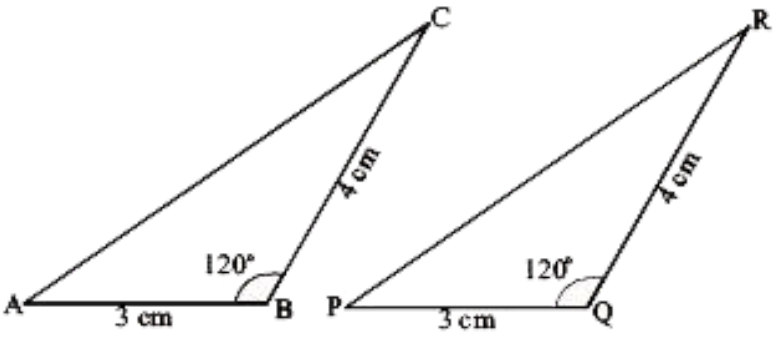
4. Two triangles ΔCAB and ΔRPQ are given below. Check whether the two are congurent? If they are congruent, what can you say about the

measures of the remaining elements of the triangles.



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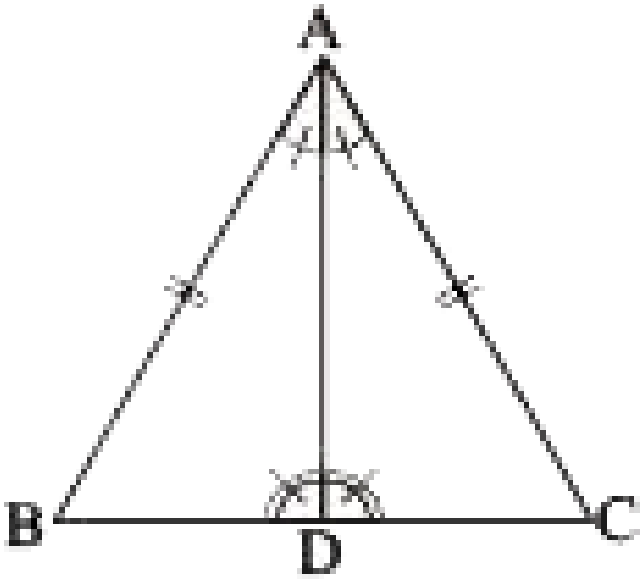
5. In the following picture, the equal angles in the two triangles are shown. Are the triangles congruent?



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6. Given below are measurements of some part of two triangles.Check whether the two triangles are congruent or not,using RHS congurence rule.In case of congruent triangle,write the result in symboilic form:

$(\Delta ABC, \Delta PQR)(\angle B = 90^\circ, AC = 8cm, AB = 3cm, \angle P = 90^\circ, PR =$

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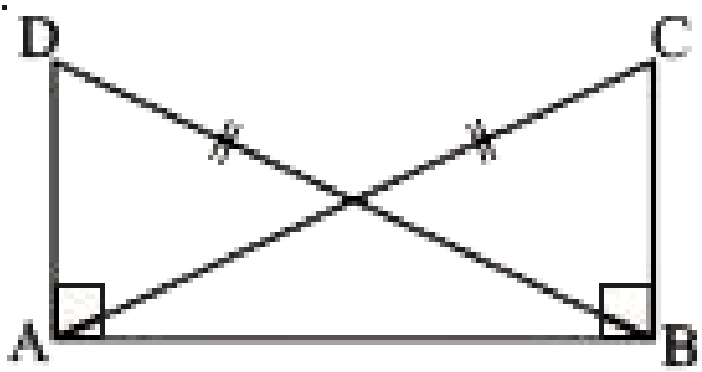
8. In the adjacent figure, $\overline{DA} \perp \overline{AB}, \overline{CB} \perp \overline{AB}$ and $AC = BD$. Prove that



$\Delta ABC \cong \Delta BAD$

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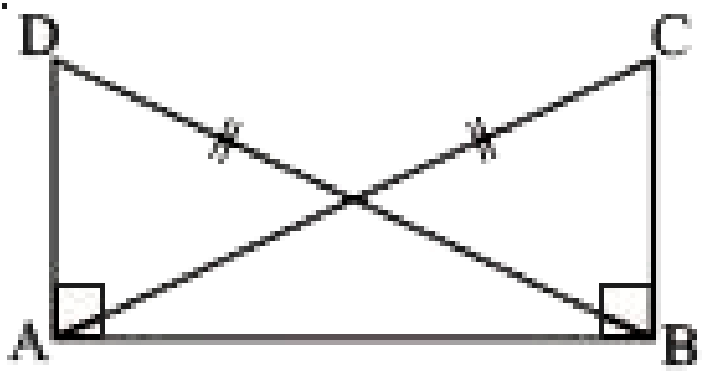

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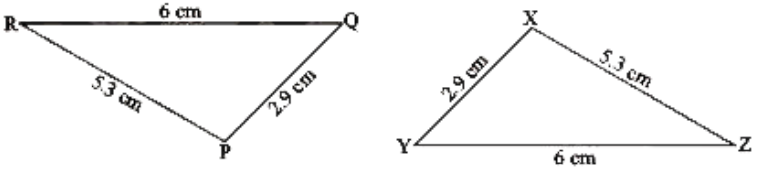

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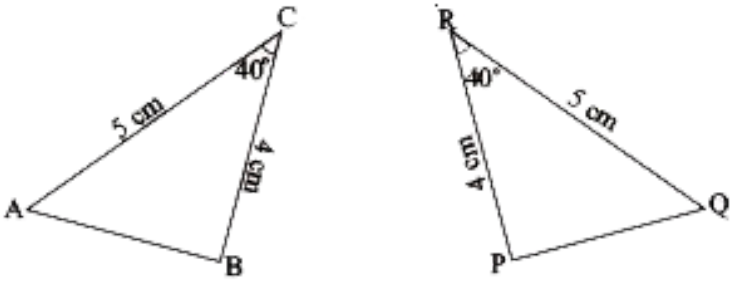

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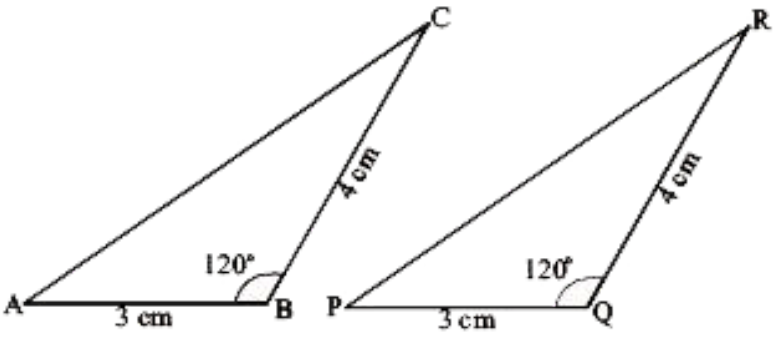

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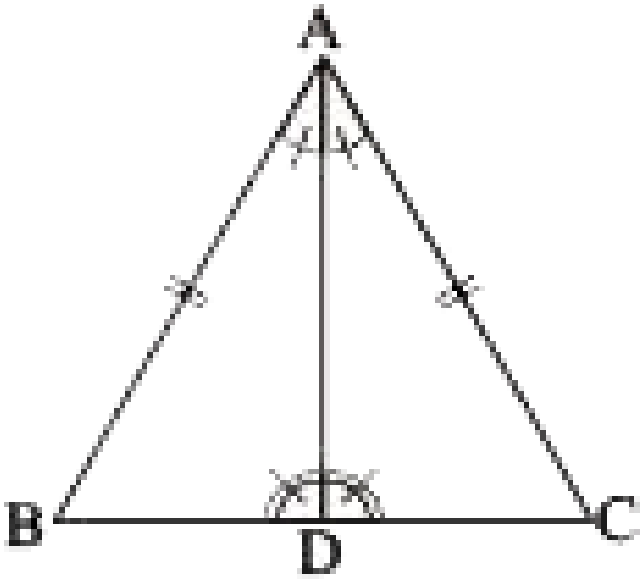

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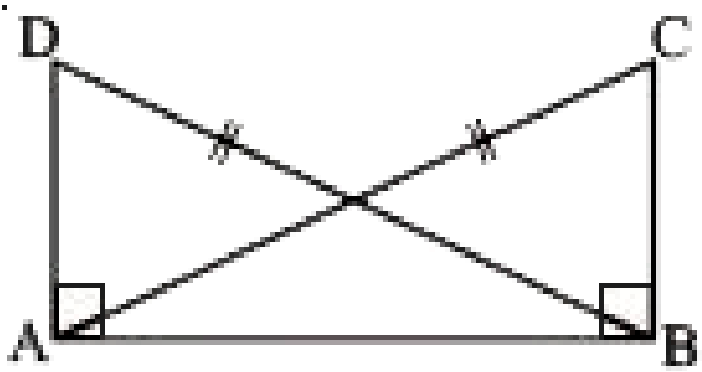

$\Delta ABC \cong \Delta BAD$

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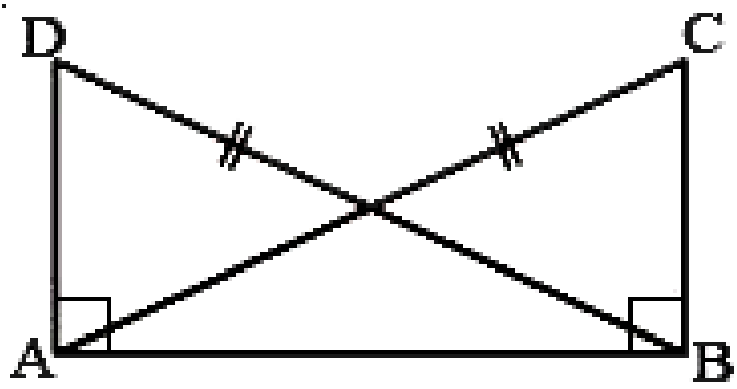
Is $\Delta ABC \cong \Delta BAD$



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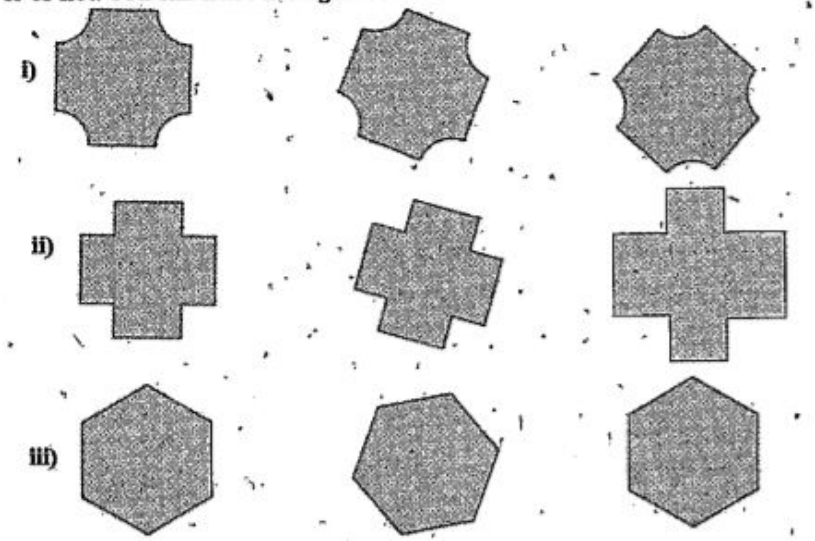
Do This

1. Here are some shapes. See whether all the shapes given in a row are congruent to each other or not. You can trace the figures and check.



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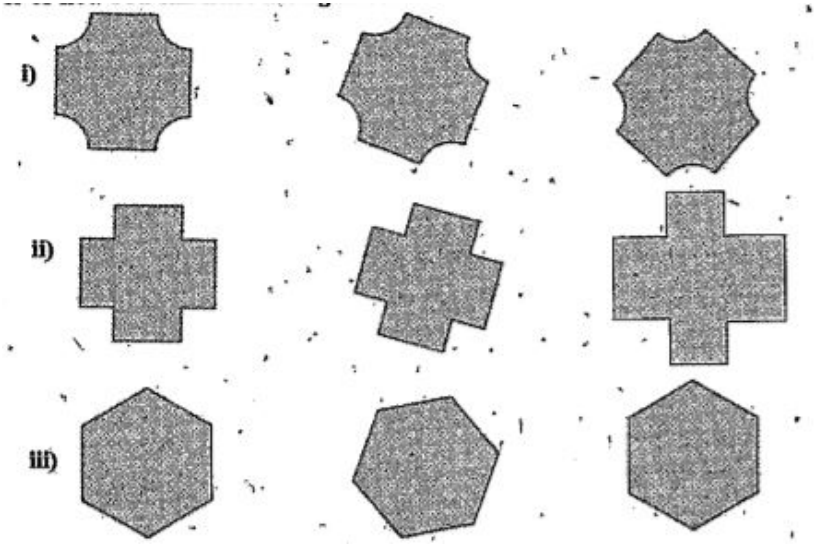

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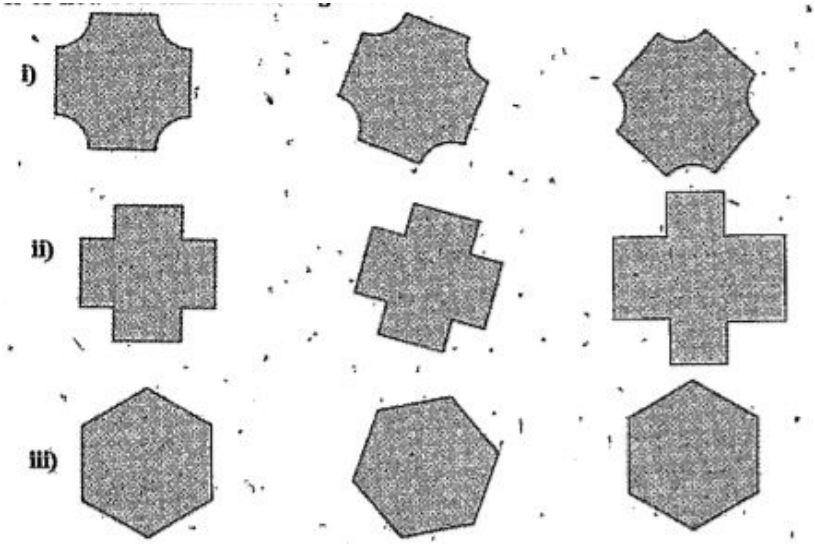

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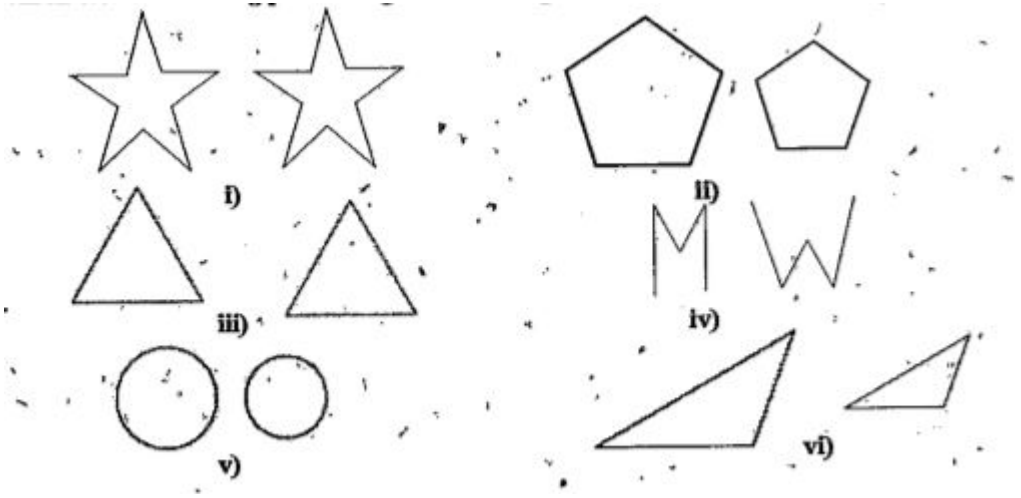

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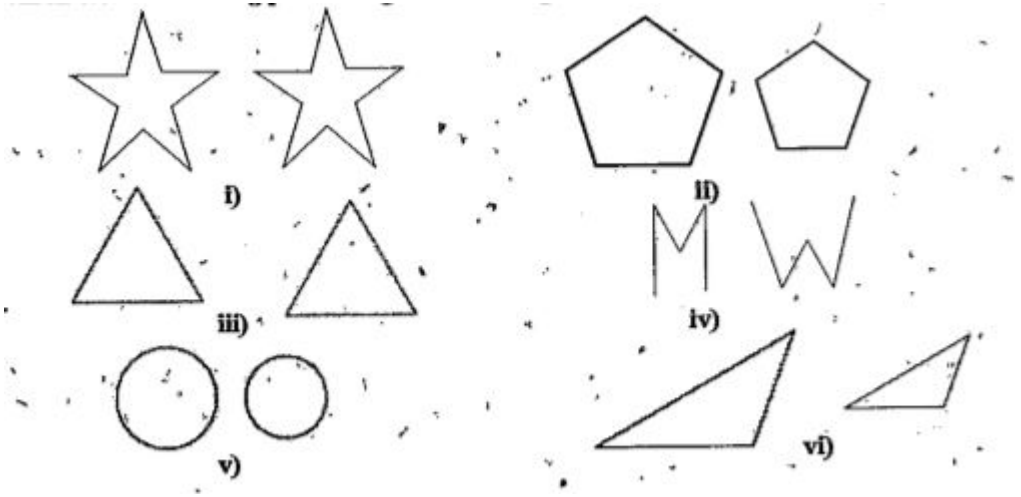

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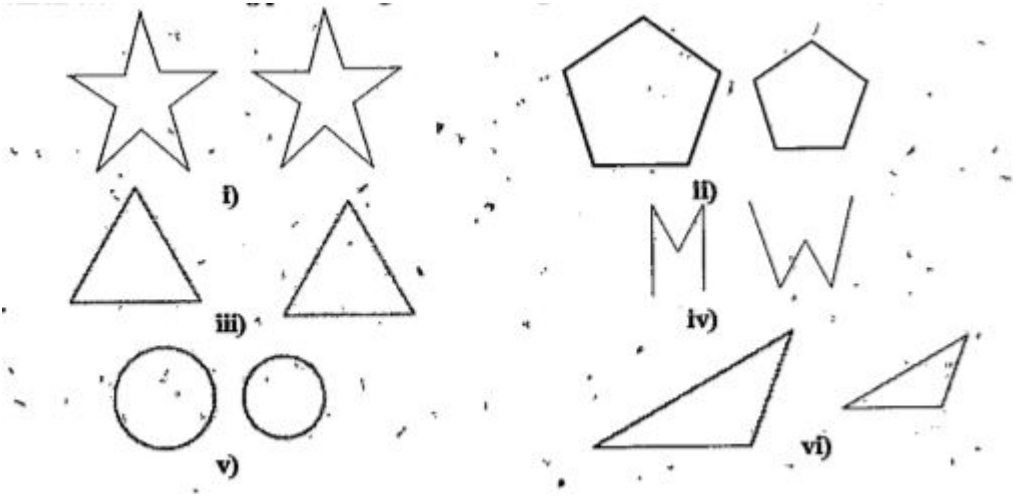

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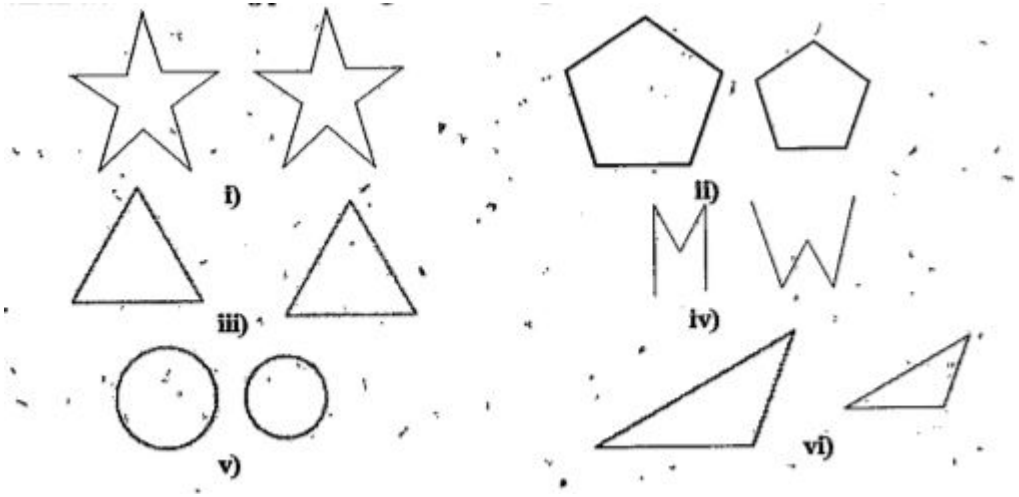

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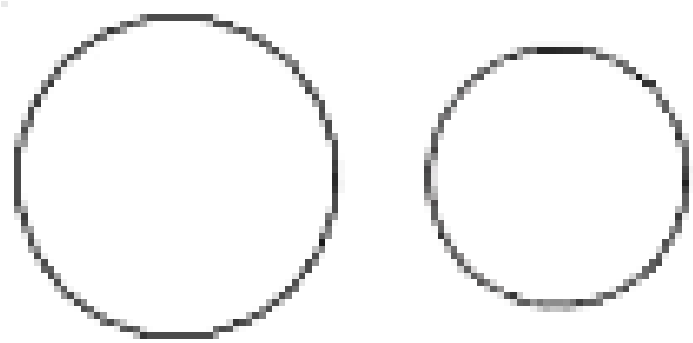

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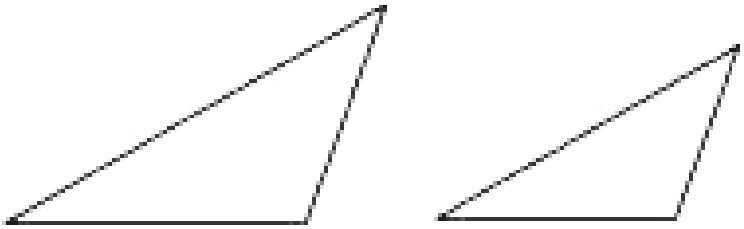

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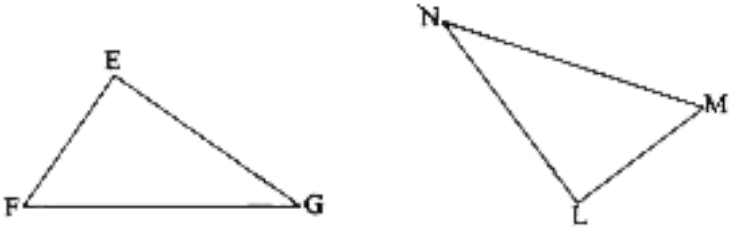
10. $\Delta EFG \cong \Delta LMN$



Write the corresponding vertices, angles and sides of the two triangles.

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11. If $\Delta ABC \cong \Delta DEF$, write the parts of ΔABC that correspond to DE

.

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12. If $\Delta ABC \cong \Delta DEF$, write the parts of ΔABC that correspond to $\angle E$.

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13. If $\Delta ABC \cong \Delta DEF$, write the parts of ΔABC that correspond to DF

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14. If $\Delta ABC \cong \Delta DEF$, write the parts of ΔABCthat correspond to EF .

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15. If $\Delta ABC \cong \Delta DEF$, write the parts of ΔABC that correspond to $\angle F$

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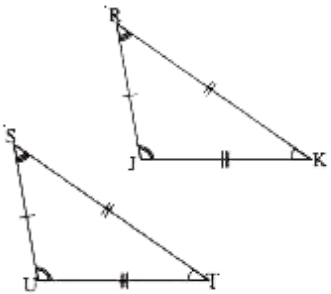
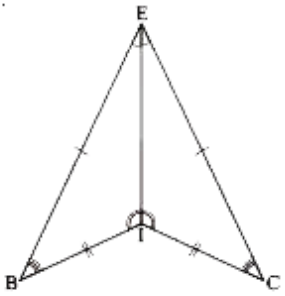
16. Name the congruent triangles in each of the following pairs. Write the statement using ' $\cong$ '





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17. Name the congruent angles and sides for each pair of congruent triangles : $\Delta TUV \cong \Delta XYZ$

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18. Name the congruent angles and sides for each pair of congruent triangles : $\Delta CDG \cong \Delta RSW$

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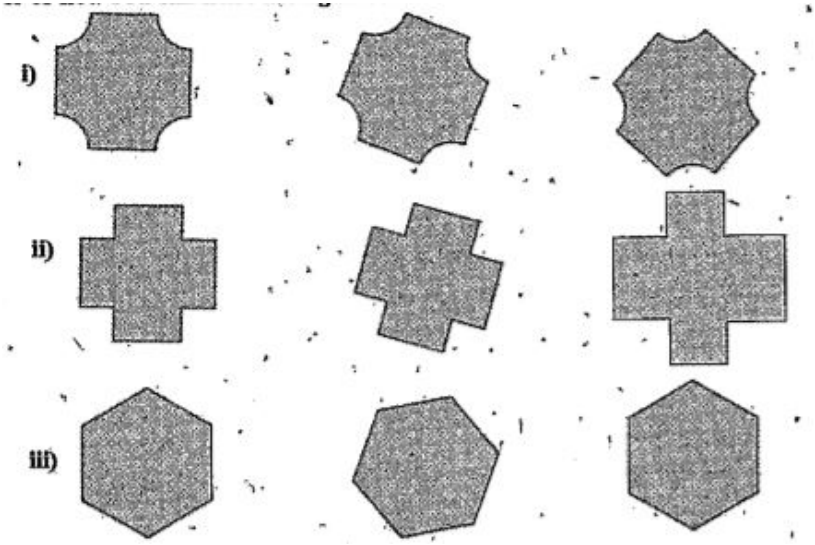

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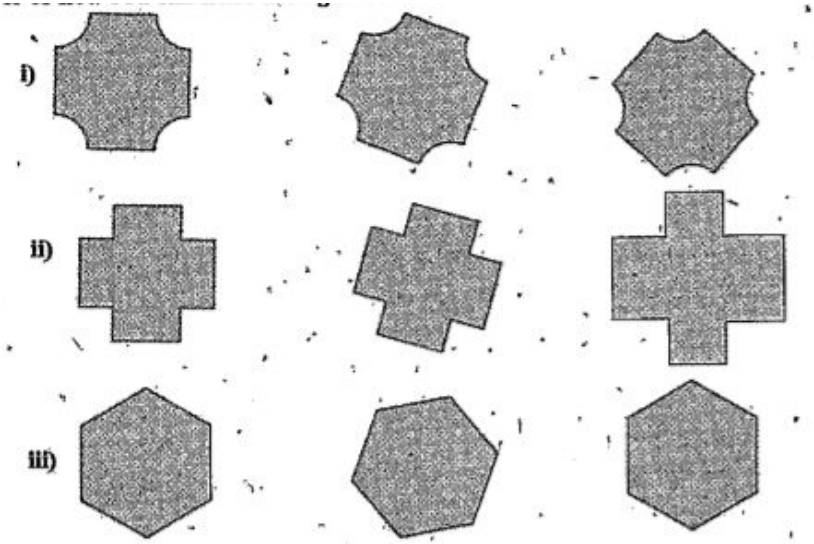

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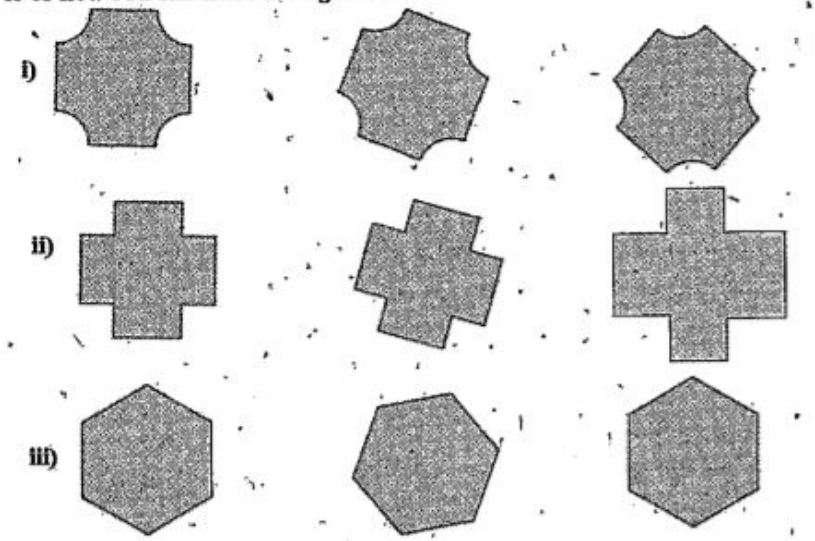

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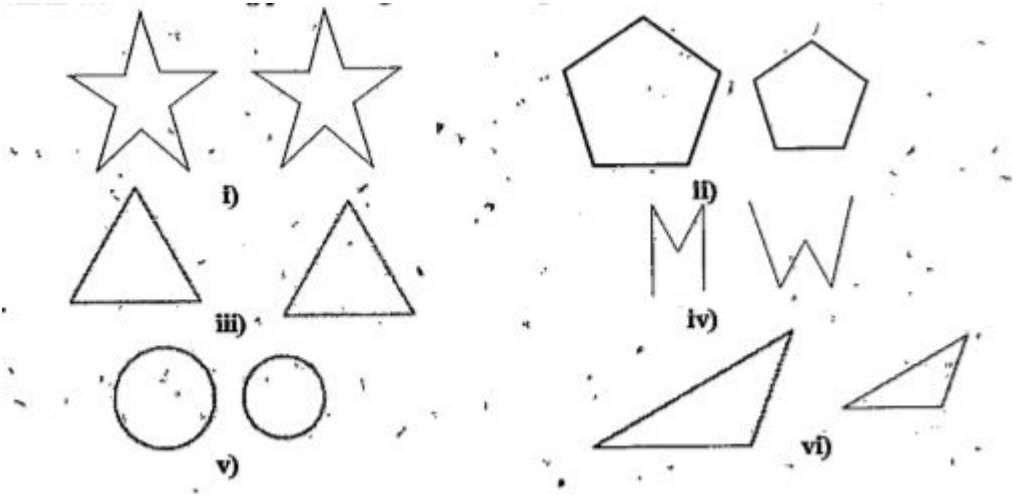

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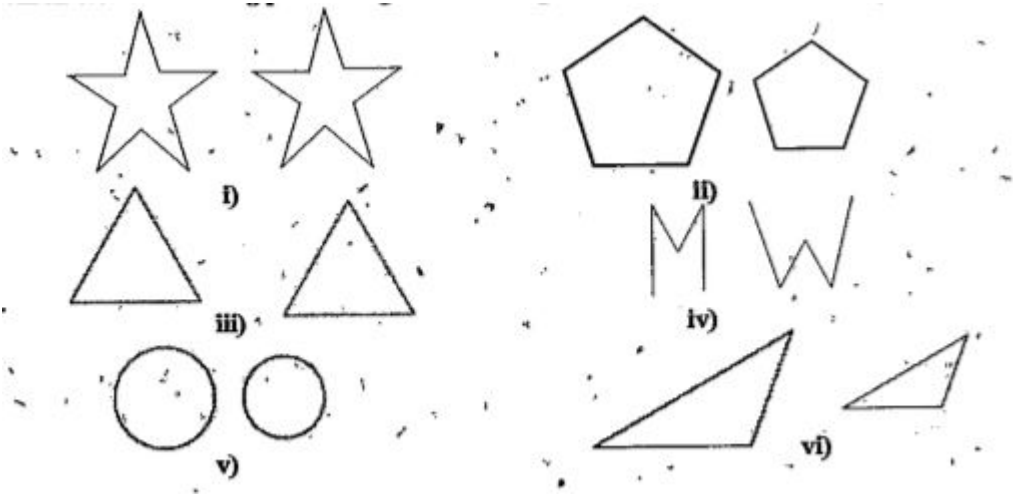

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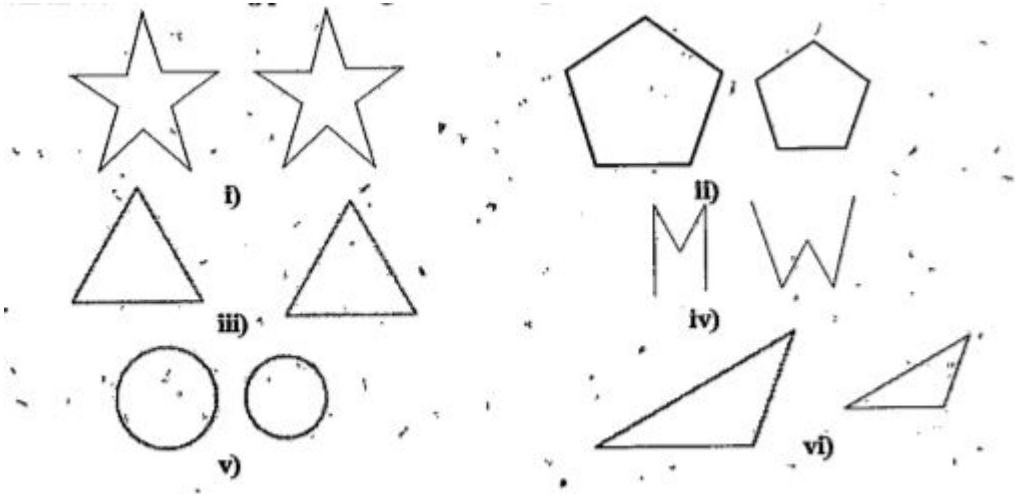

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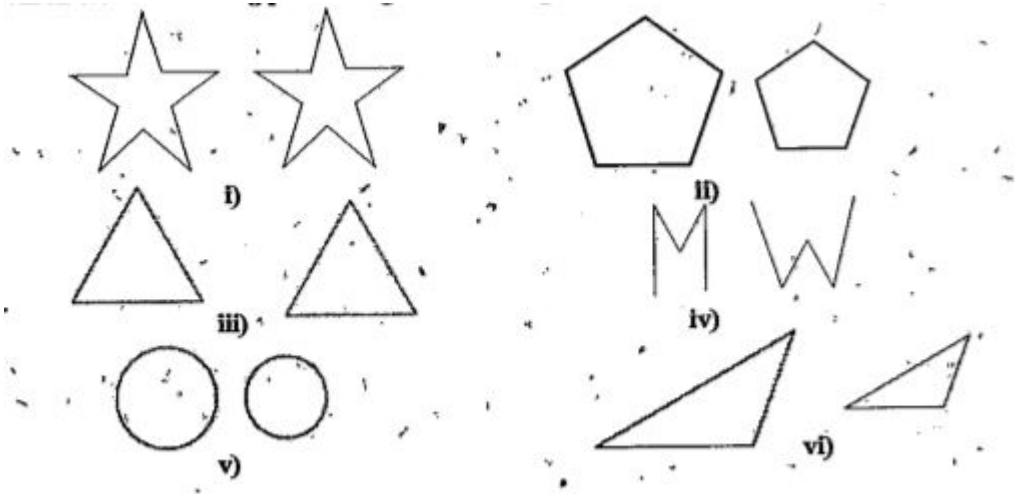

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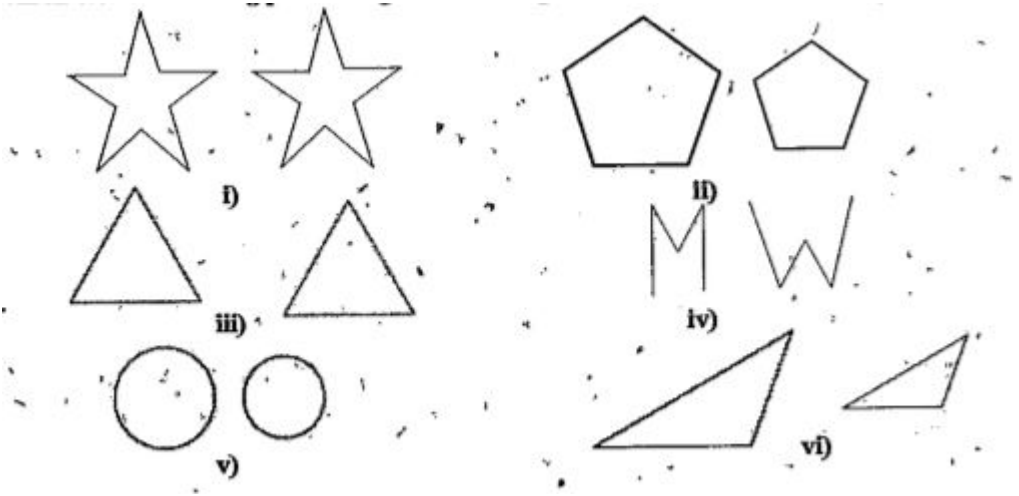

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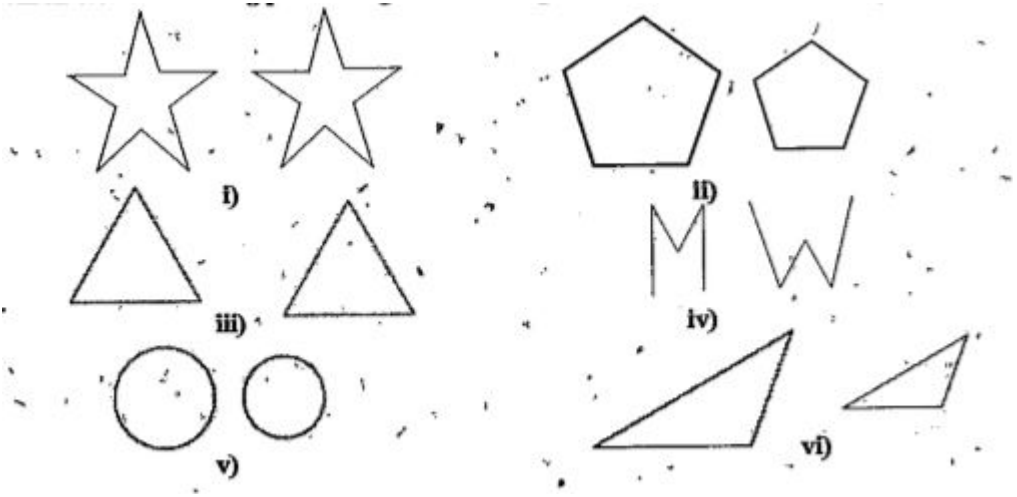

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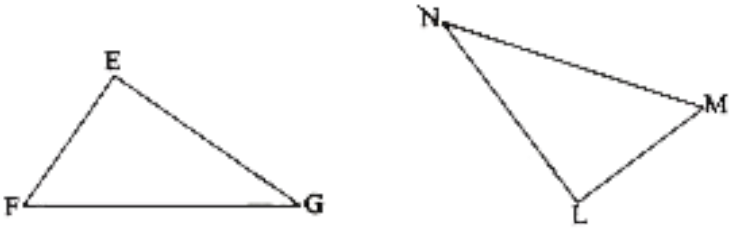
28. $\Delta EFG \cong \Delta LMN$



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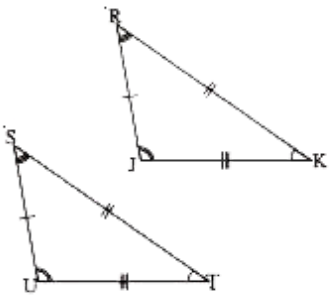

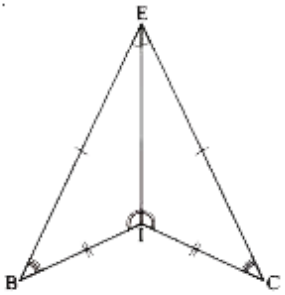

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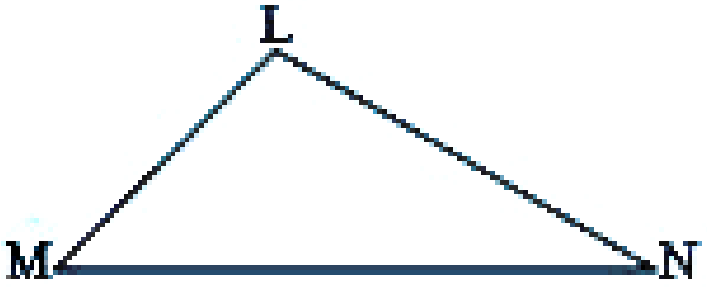
Try This

1. Measure the lengths of ΔLMN . Now , construct a triangle with these measurements on a sheet of paper. Place this triangle over ΔLMN . Are

the triangles congruent? What criterion of congruency applies over here?



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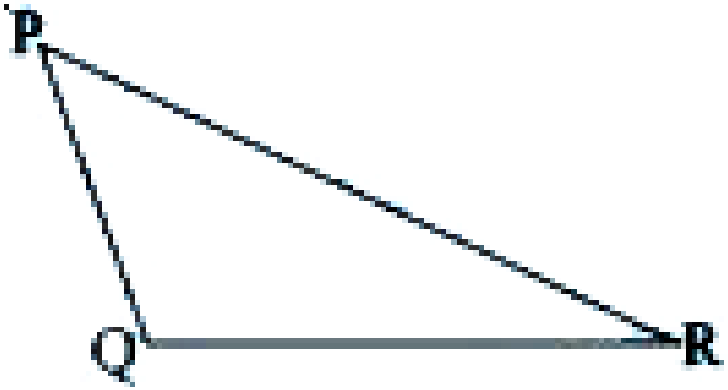
2. In ΔPQR measure the lengths PQ and QR as well as $\angle Q$. Now, construct a triangle with these three measurements on a sheet of paper. Place this triangle over ΔPQR. Are the triangles congruent? What criterion of congruency applies over here ?



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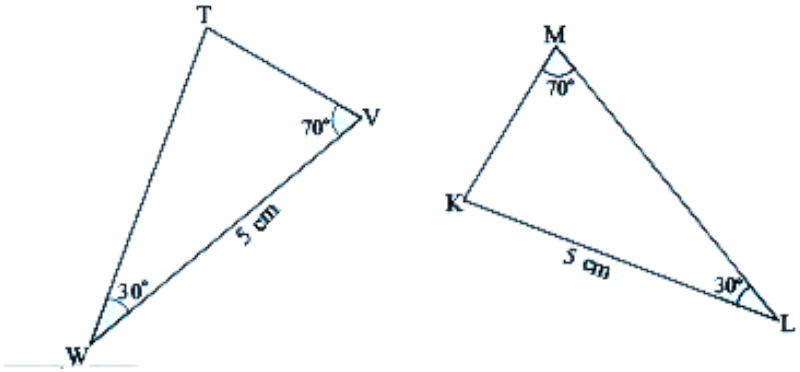
3. Is the following pair of triangles congurent? Give reason to support your answer.



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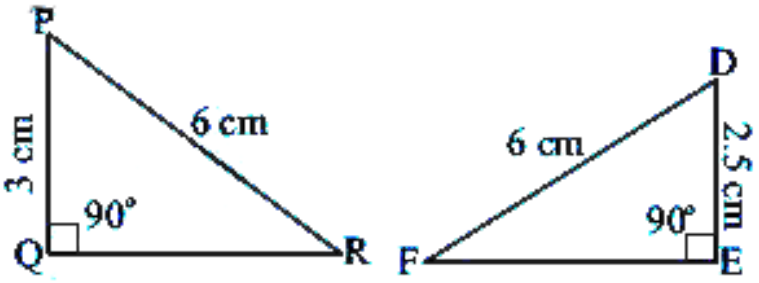
4. In the figures given below, measures of some parts of triangles are given. By applying RHS congruence rule, state which pairs of triangles are congruent. In case of congruent triangles, write the result in symbolic

form.



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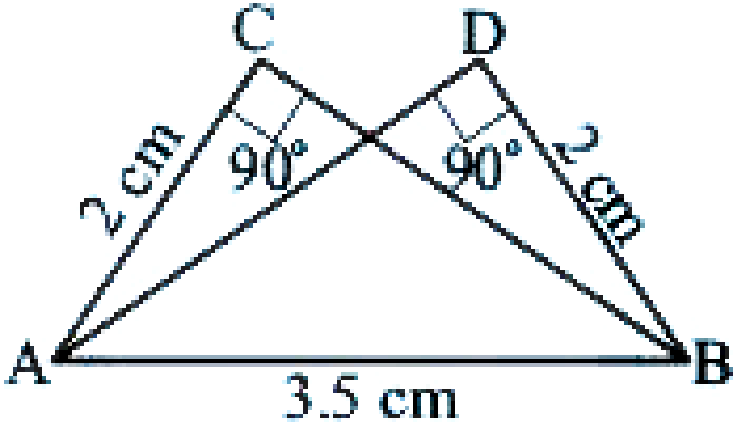
5. By applying RHS congruence rule, state triangles are congruent. In case of congruent triangles, write the result in symbolic form.



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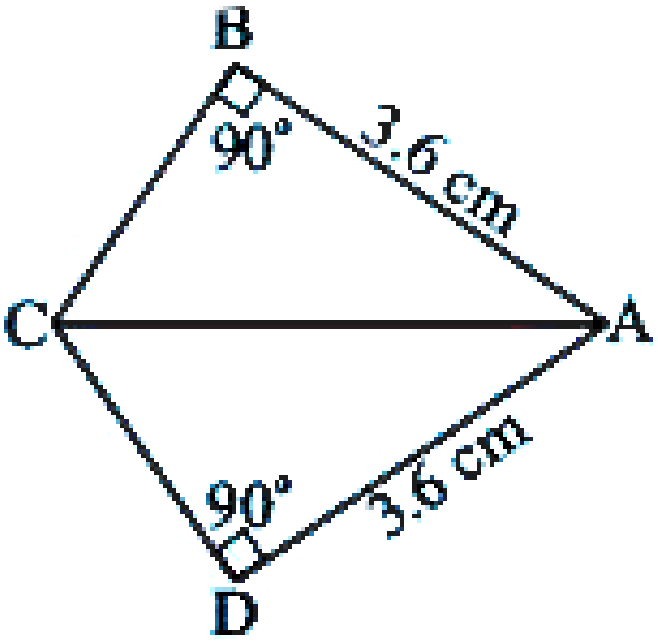

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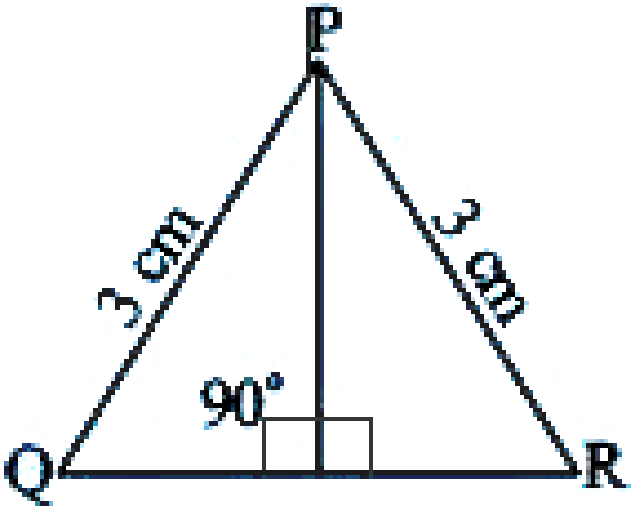

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8. It is to be established by R.H.S congruence rule that $\Delta ABC \cong \Delta RPQ$. What additional information is needed, if it is given that $\angle B = \angle P = 90^\circ$ and AB= RP ?

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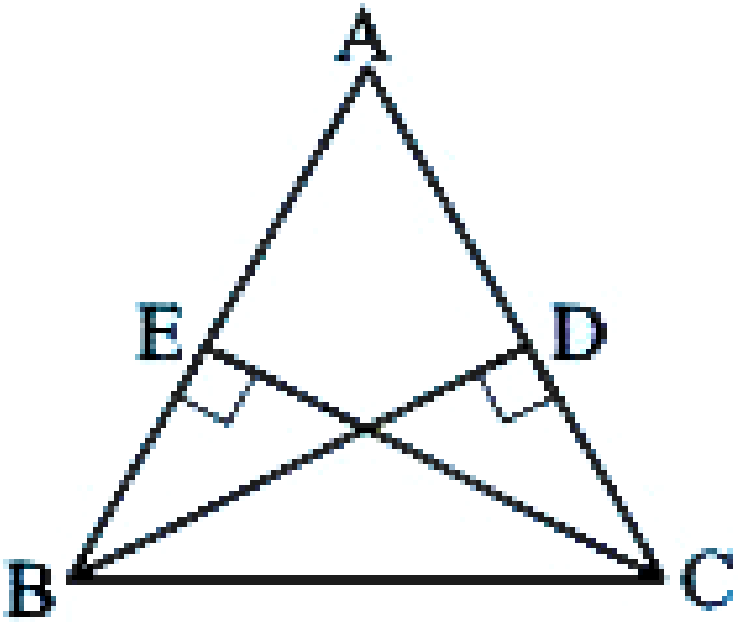
9. In the adjacent figure, $\overline{BD}$ and $\overline{CE}$ are altitudes of ΔABC such that BD= CE.



State the three pairs of equal parts in ΔCBD and ΔBCE.

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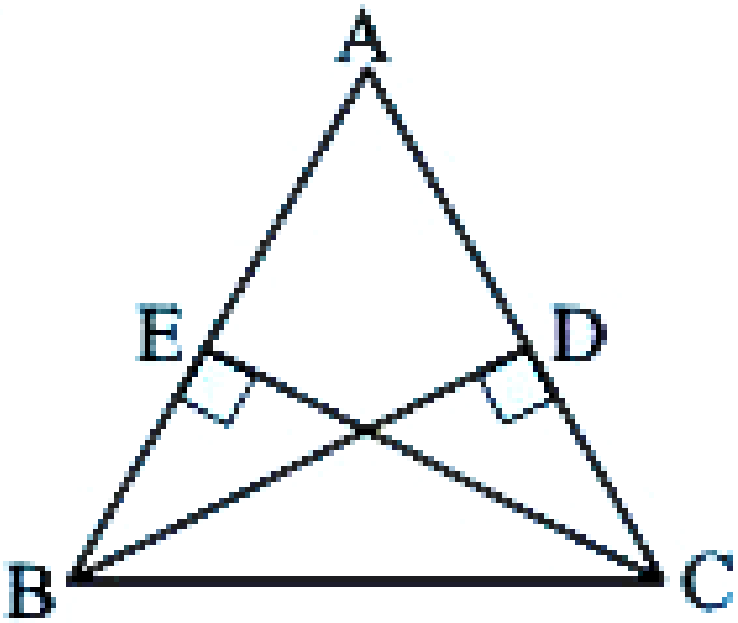
10. In the adjacent figure, $\overline{BD}$ and $\overline{CE}$ are altitudes of ΔABC such that BD= CE. Is $\Delta CBD \cong \Delta BCE$? Why or why not?



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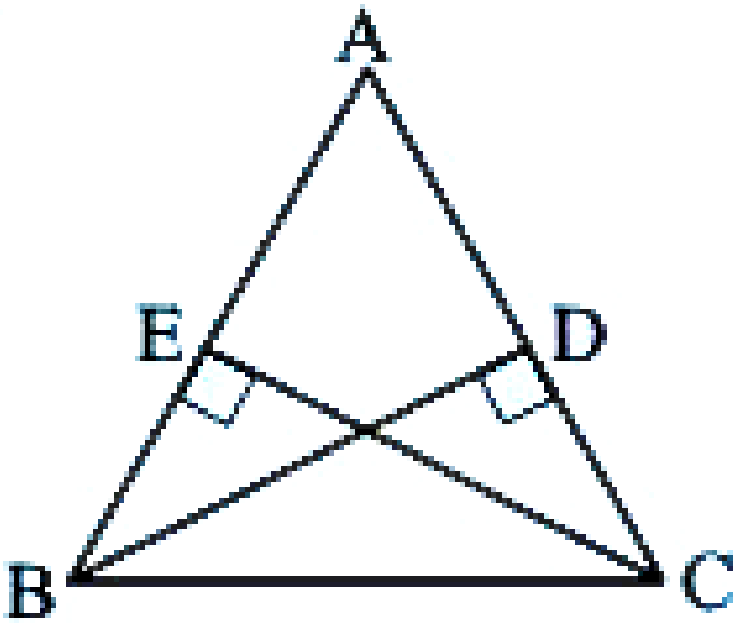
11. In the adjacent figure, $\overline{BD}$ and $\overline{CE}$ are altitudes of ΔABC such that BD= CE. Is $\Delta CBD \cong \Delta BCE$? Why or why not?



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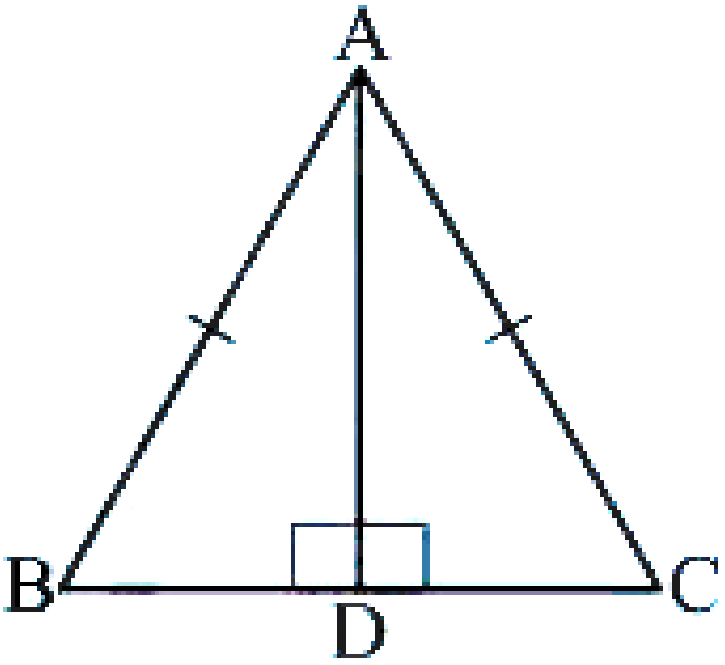
12. ABC is an isoscles triangle with $\overline{AB} = \overline{AC}$ and $\overline{AD}$ is one of its altitudes (fig..).



State the three pairs of equal parts in ΔADB and ΔADC.

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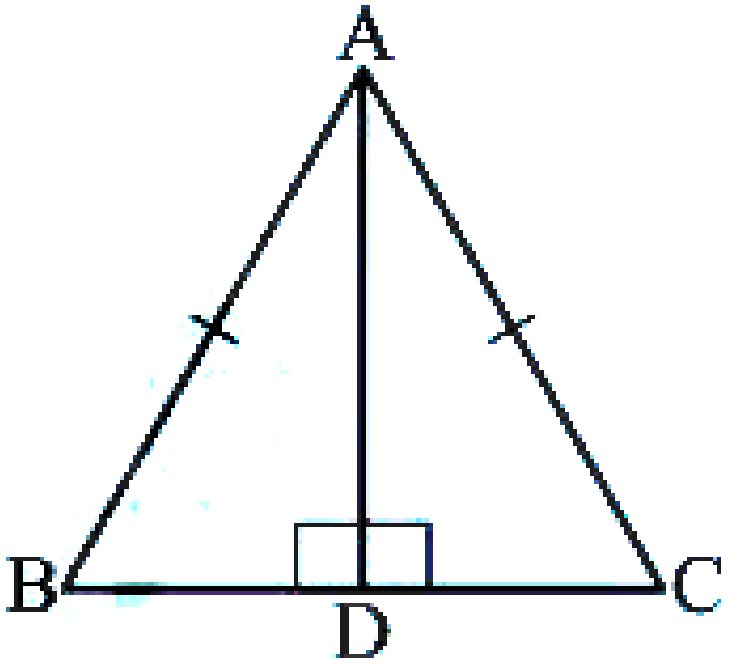
13. ABC is an isoscles triangle with $\overline{AB} = \overline{AC}$ and $\overline{AD}$ is one of its altitudes. Is $\Delta ADB \cong \Delta ADC$? Why or why not?



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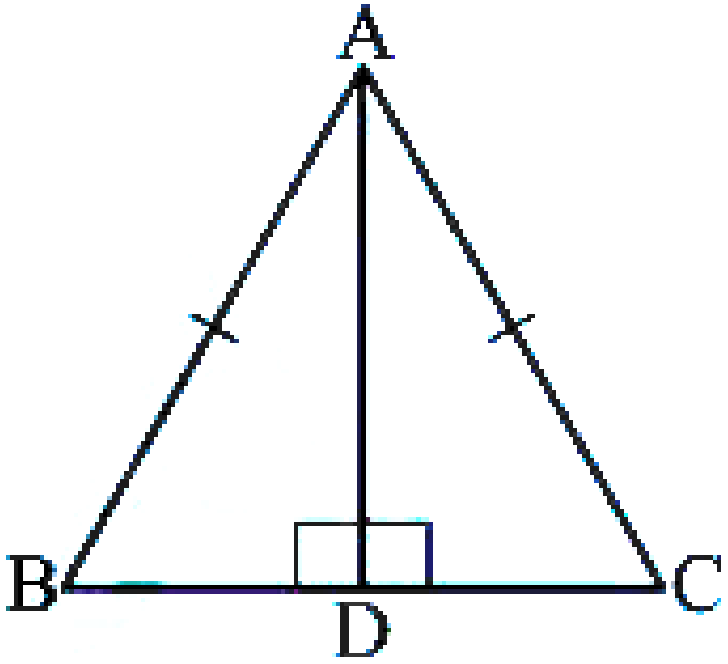
14. ABC is an isosceles triangle with $\overline{AB} = \overline{AC}$ and $\overline{AD}$ is one of its altitudes (fig..). Is $\triangle ABD \cong \triangle ACD$? Why or why not?



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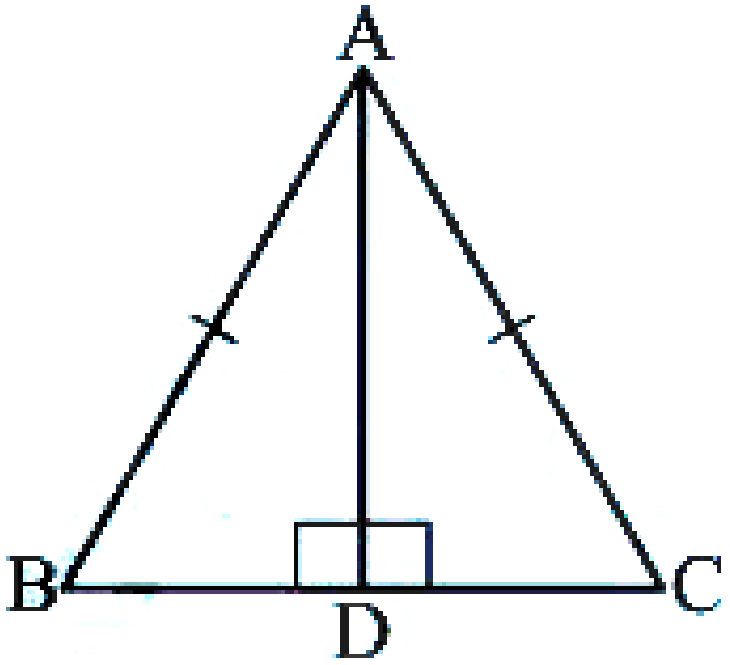
15. ABC is an isoscles triangle with $\overline{AB} = \overline{AC}$ and $\overline{AD}$ is one of its altitudes. Is $BD = CD$? Why or why not?



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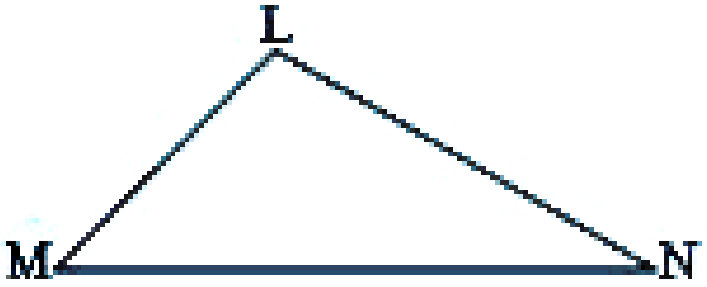
16. Measure the lengths of ΔLMN . Now , construct a triangle with these measurements on a sheet of paper. Place this triangle over ΔLMN . Are

the triangles congruent? What criterion of congruency applies over here?



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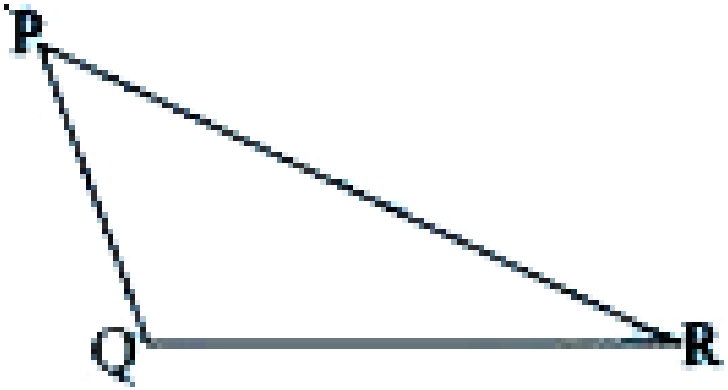
17. In ΔPQR measure the lengths PQ and QR as well as $\angle Q$. Now, construct a triangle with these three measurements on a sheet of paper. Place this triangle over ΔPQR. Are the triangles congruent? What criterion of congruency applies over here ?



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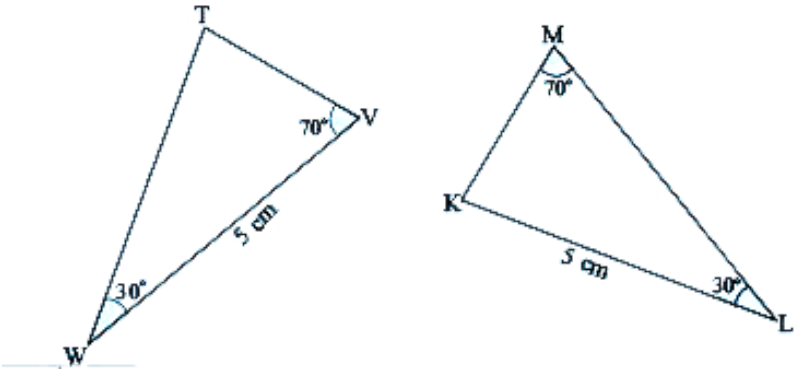
18. Is the following pair of triangles congurent? Give reason to support your answer.



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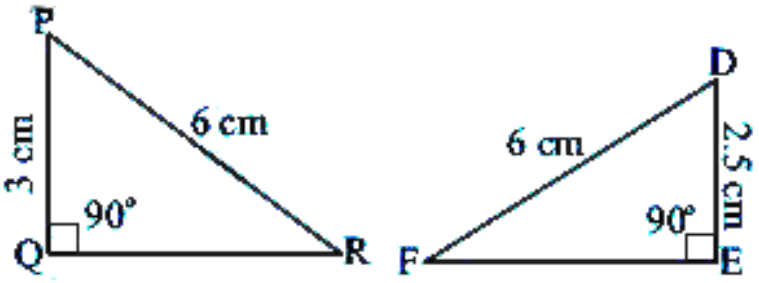
19. In the figures given below, measures of some parts of triangles are given. By applying RHS congruence rule, state which pairs of triangles are congruent. In case of congruent triangles, write the result in symbolic

form.



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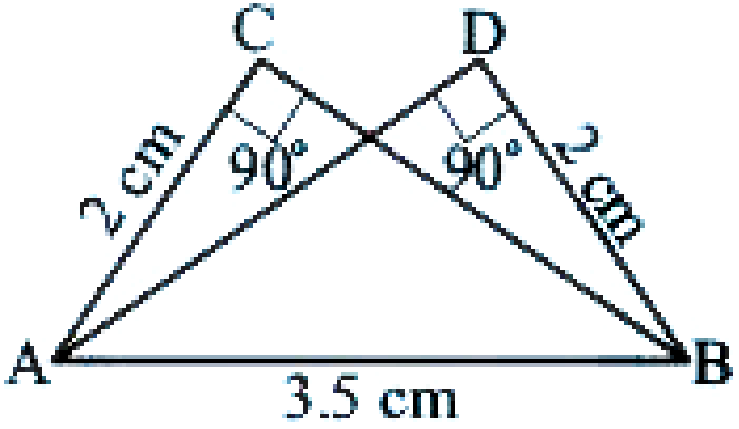
20. By applying RHS congruence rule, state triangles are congruent. In case of congruent triangles, write the result in symbolic form.



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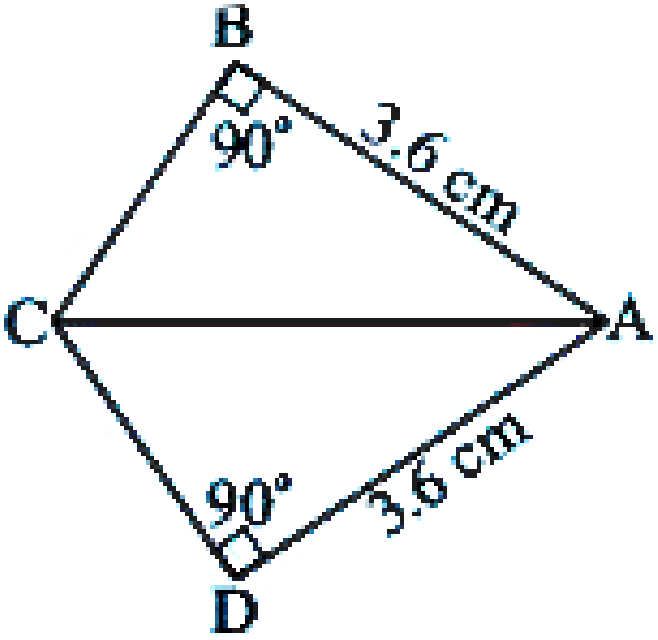
21. In the figures given below, measures of some parts of triangles are given. By applying RHS congruence rule, state which pairs of triangles are congruent. In case of congruent triangles, write the result in symbolic form.



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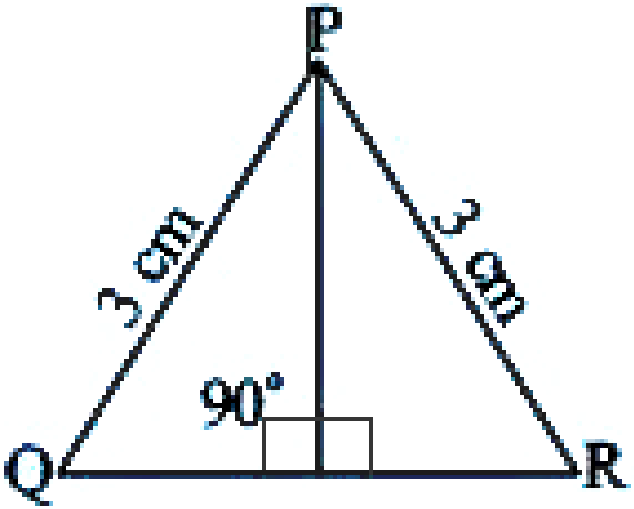
22. By applying RHS congruence rule, state which pairs of triangles are congruent. In case of congruent triangles, write the result in symbolic

form.



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23. It is to be established by R.H.S congruence rule that $\Delta ABC \cong \Delta RPQ$. What additional information is needed, if it is given that $\angle B = \angle P = 90^\circ$ and AB= RP ?

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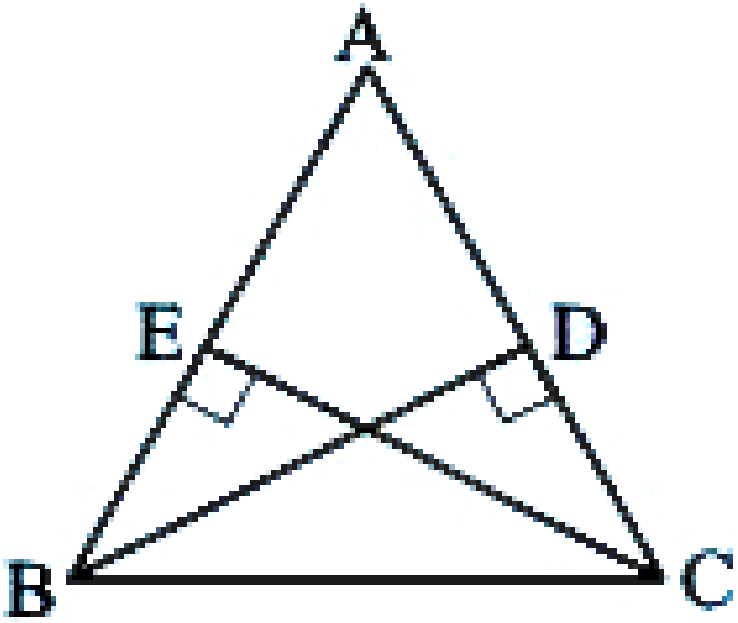
24. In the adjacent figure, $\overline{BD}$ and $\overline{CE}$ are altitudes of ΔABC such that BD= CE.



State the three pairs of equal parts in ΔCBD and ΔBCE.

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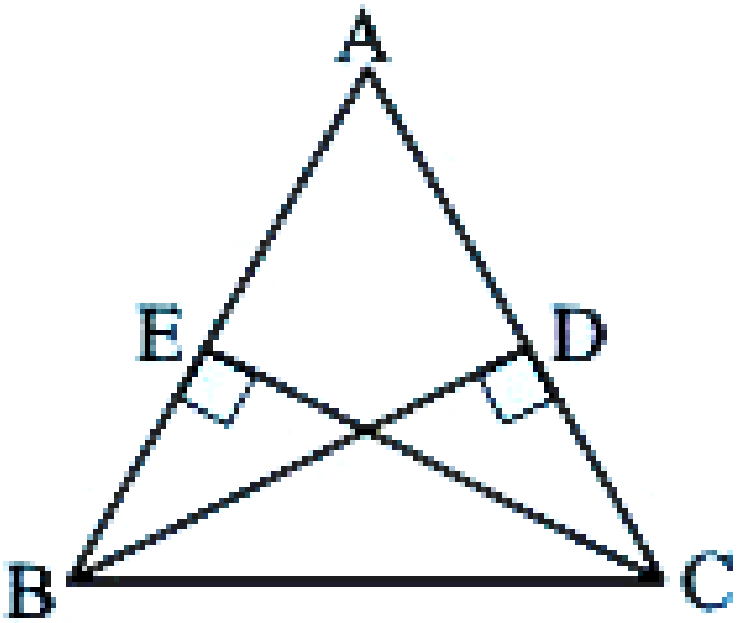
25. In the adjacent figure, $\overline{BD}$ and $\overline{CE}$ are altitudes of ΔABC such that BD= CE. Is $\Delta CBD \cong \Delta BCE$? Why or why not?



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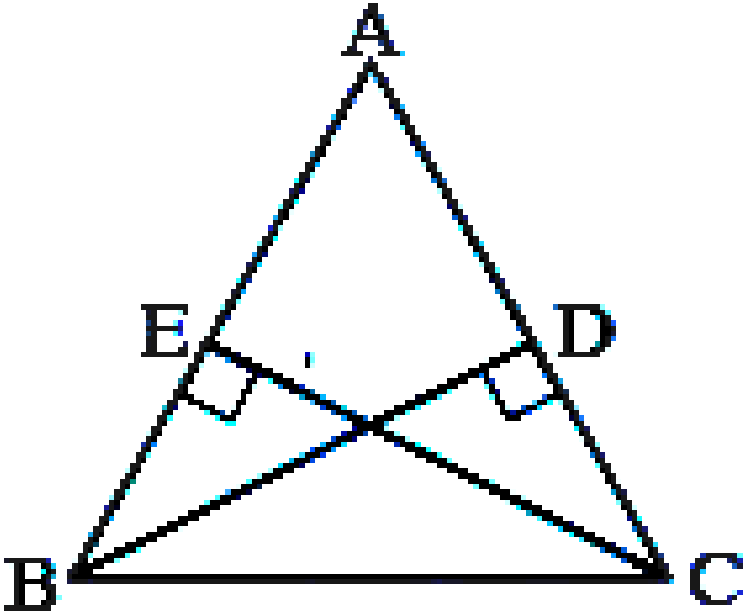
26. In the adjacent figure, BD and CE are altitudes of ΔABC such that BD = CE

Is $\angle DBC = \angle ECB$? Why or why not



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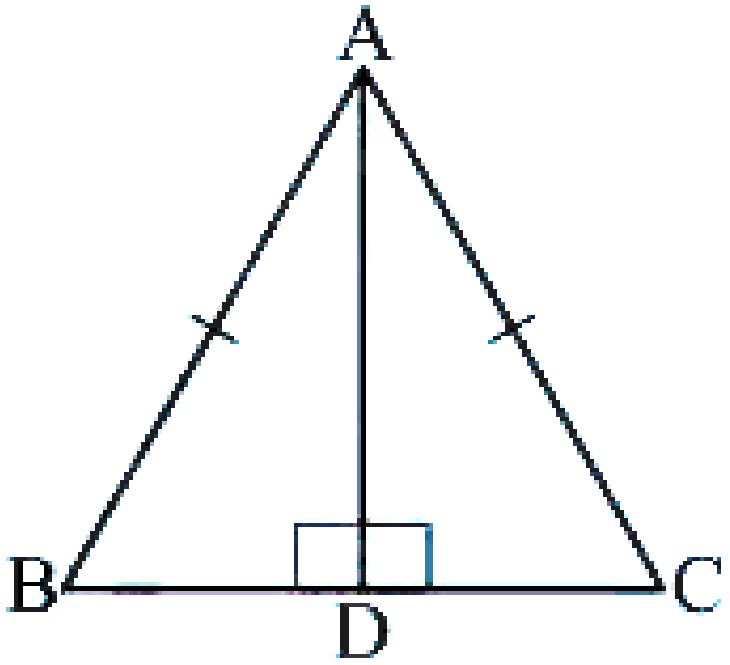
27. ABC is an isoscles triangle with $\overline{AB} = \overline{AC}$ and $\overline{AD}$ is one of its altitudes (fig..).



State the three pairs of equal parts in ΔADB and ΔADC.

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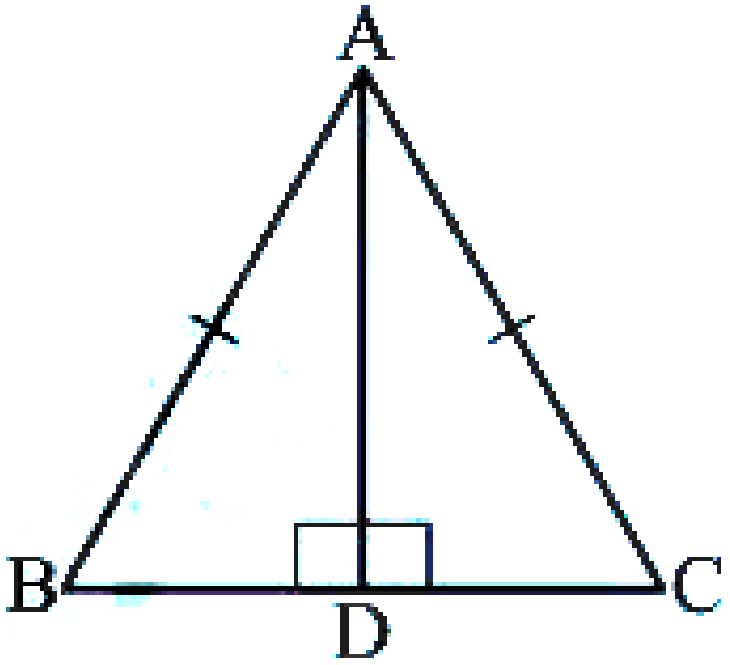
28. ABC is an isoscles triangle with $\overline{AB} = \overline{AC}$ and $\overline{AD}$ is one of its altitudes. Is $\Delta ADB \cong \Delta ADC$? Why or why not?



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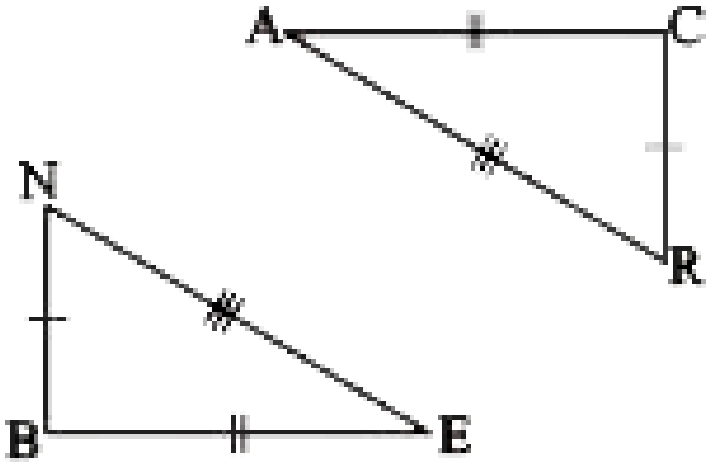
Exercise 1

1. Decide whether the SSS congruence is true with the following figures.

Give reasons



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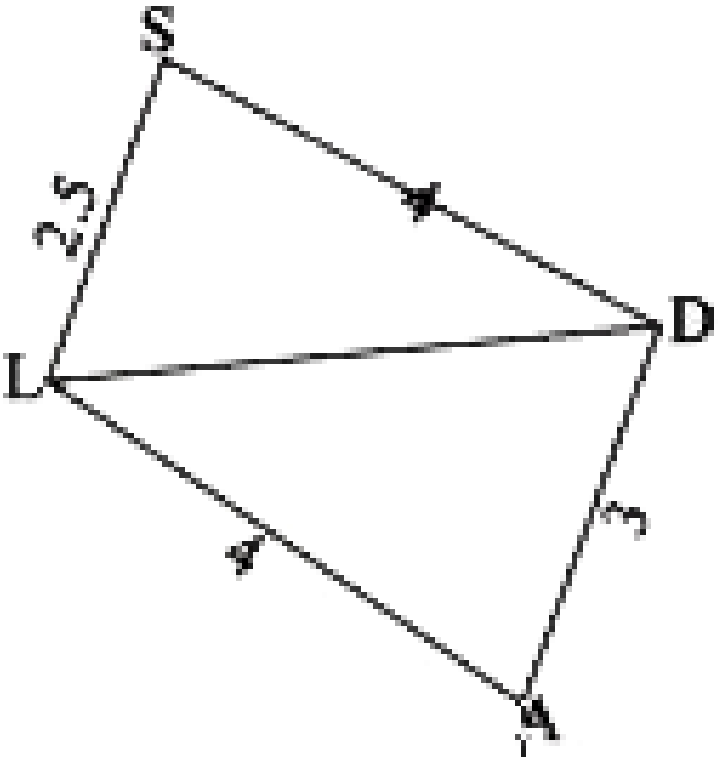
2. Decide whether the SSS congruence is true with the following figures.

Give reasons



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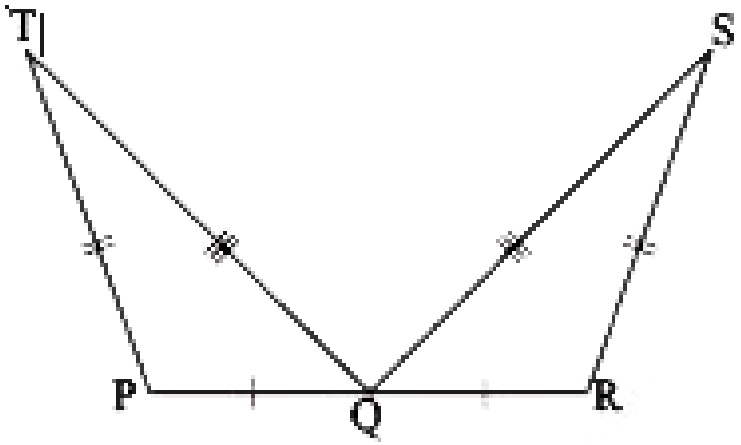
3. For the following congurent triangles, find the pairs of corresponding angles.



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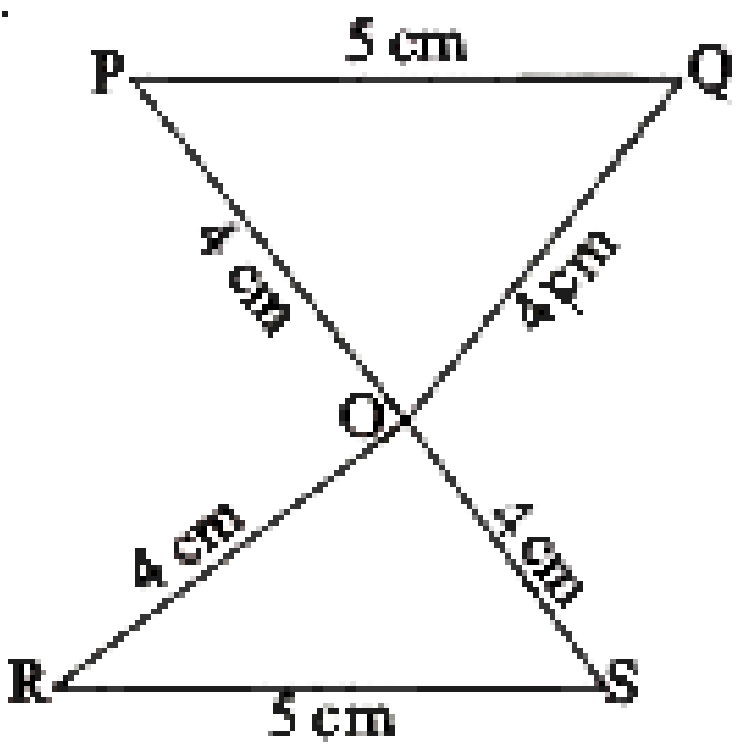
4. For the following congurent triangles, find the pairs of corresponding angles.



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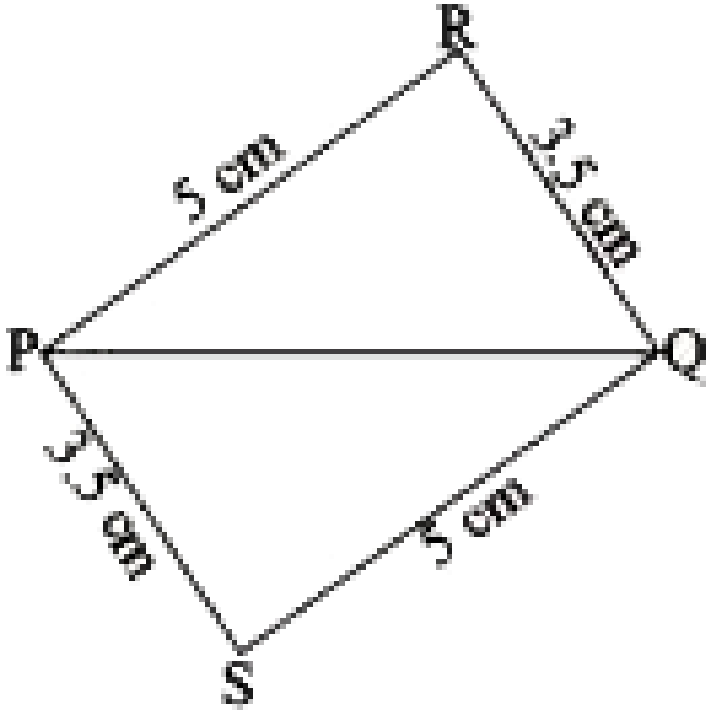
5. In adjacent figure, choose the correct answer!



A. $\Delta PQR \cong \Delta PQS$

B. $\Delta PQR \cong \Delta QPS$

C. $\Delta PQR \cong \Delta SQP$

D. $\Delta PQR \cong \Delta SPQ$

Answer: C

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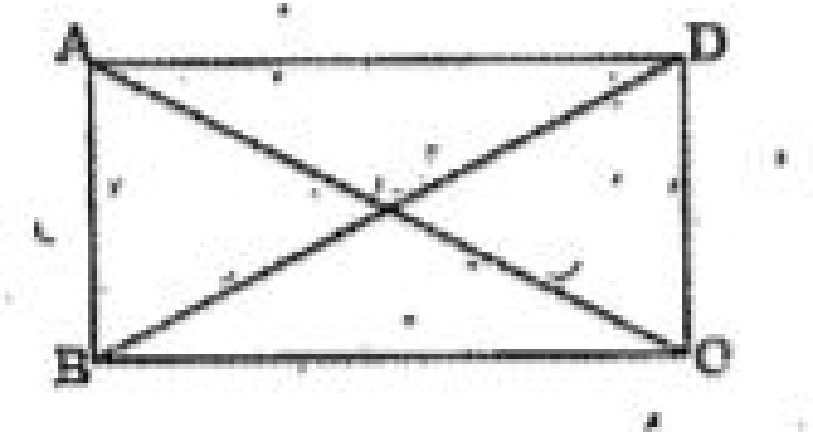
6. In the figure given below, AB= DC and AC=DB. Is $\Delta ABC \cong \Delta DCB$?



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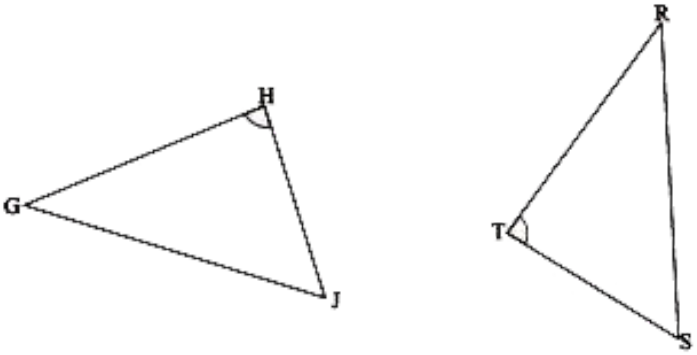
Exercise 2

1. What additional information do you need to conclude that the two triangles given here under are congruent using SAS rule?



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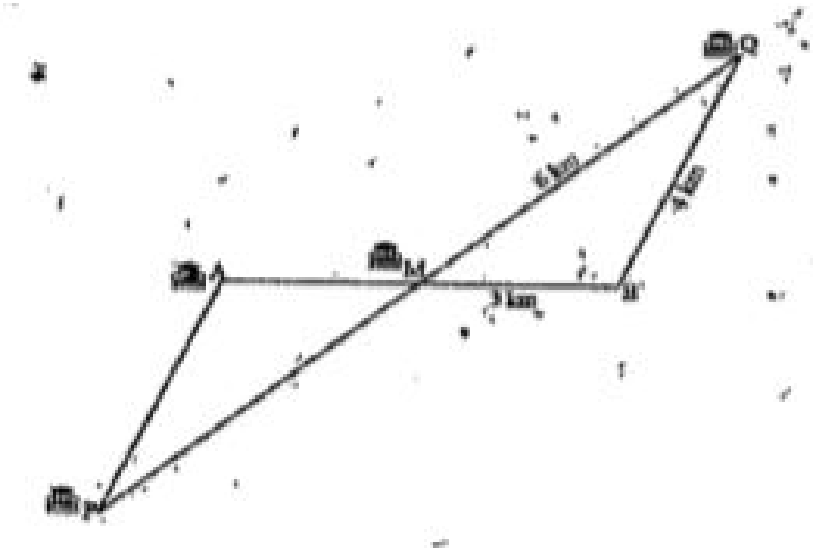
2. The map given below shows five different villages. Village M lies exactly halfway between the two pairs of villages A and B as well as P and Q. What is the distance between village A and village P. (Hint: check if $\Delta PAM \cong \Delta QBM$)



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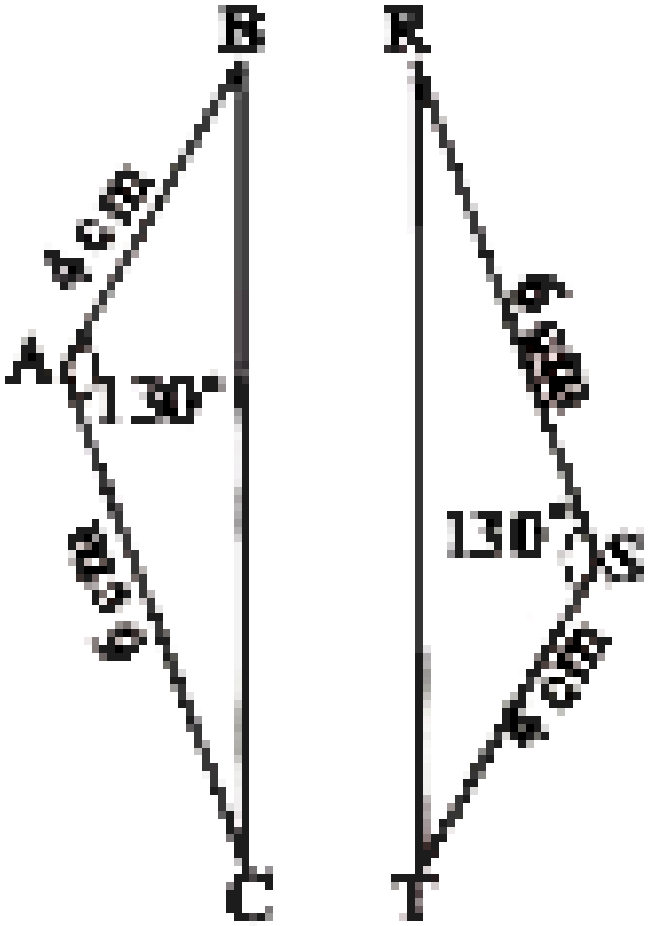
3. Look at the pairs of triangles given below. Are the congurent? If congruent write the corresponding parts.



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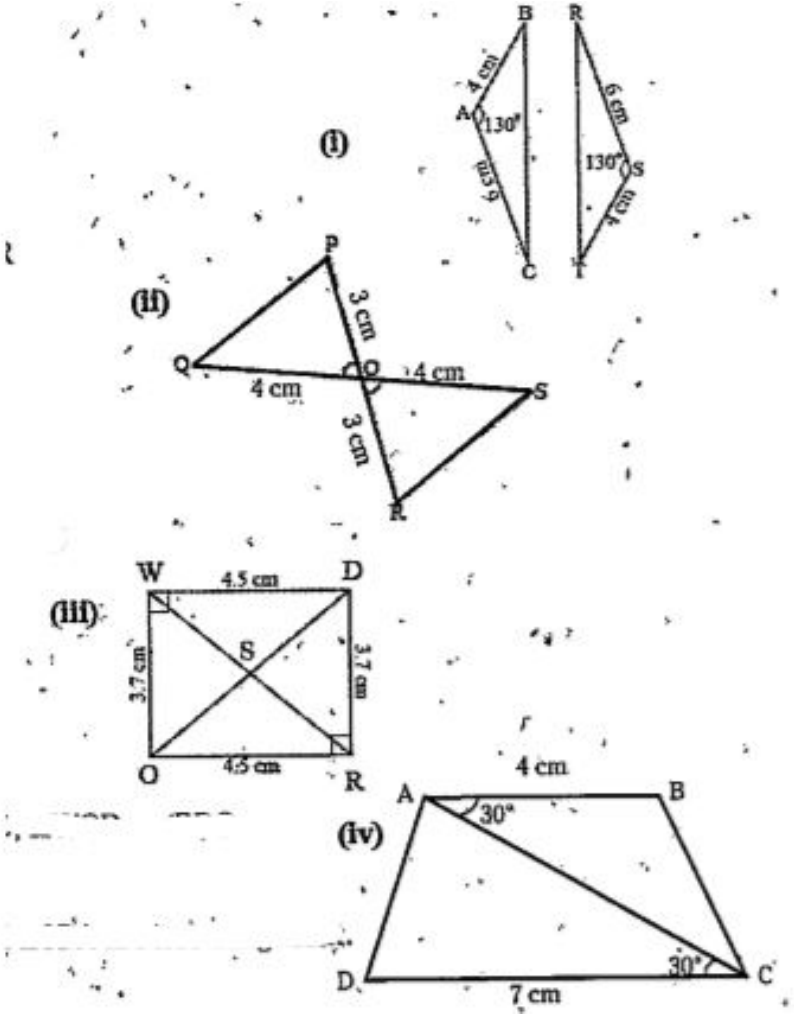
4. Look at the pairs of triangles given below. Are they congruent ? If congruent write the corresponding parts.



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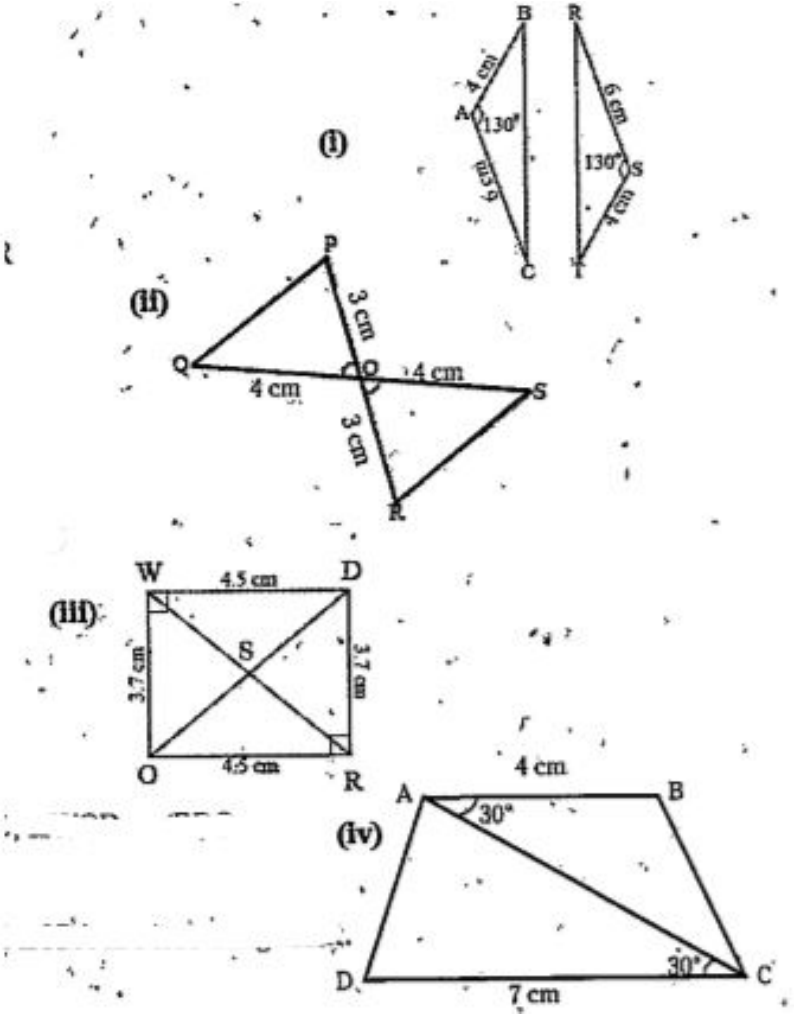
5. Look at the pairs of triangles given below. Are they congruent ? If congruent write the corresponding parts.



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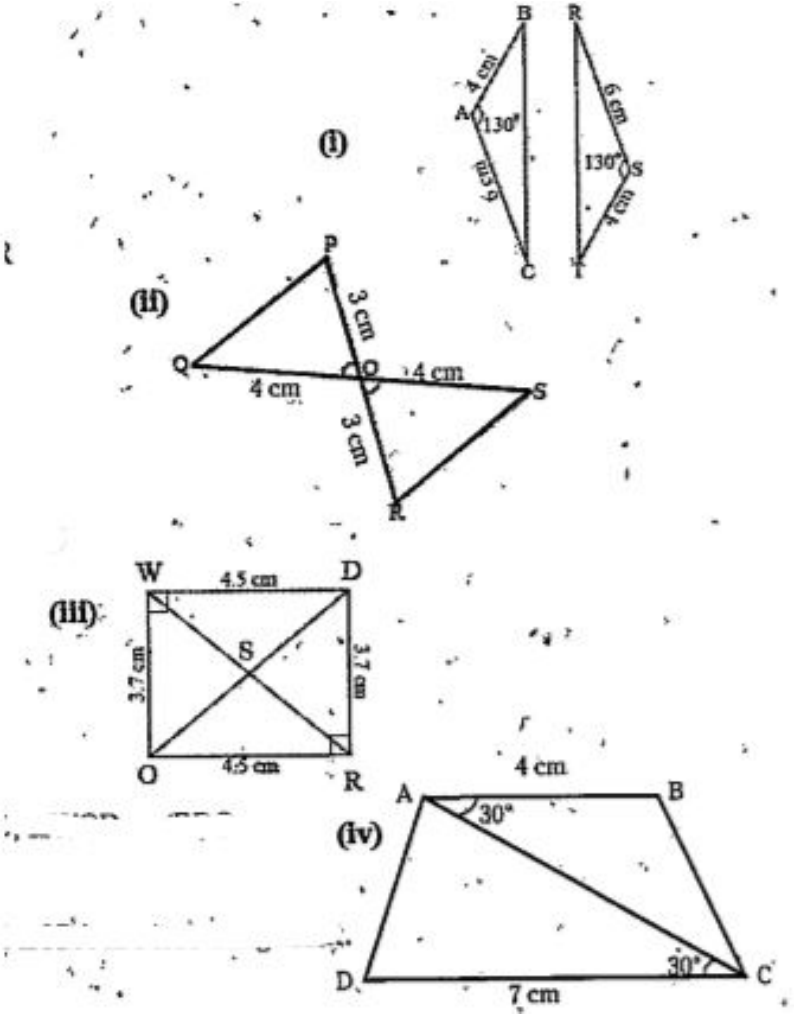
6. Look at the pairs of triangles given below. Are they congruent ? If congruent write the corresponding parts.



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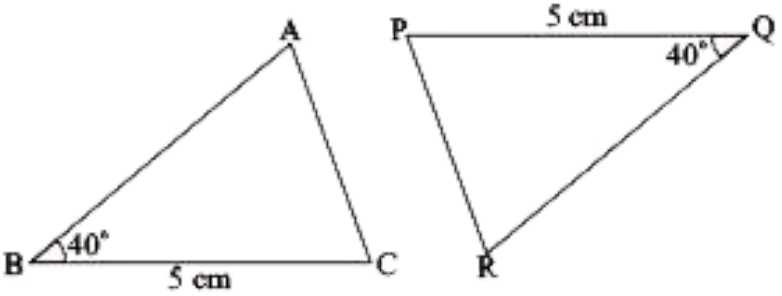
7. Which corresponding sides do we need to know to prove that the triangles are congruent using the SAS criterion?



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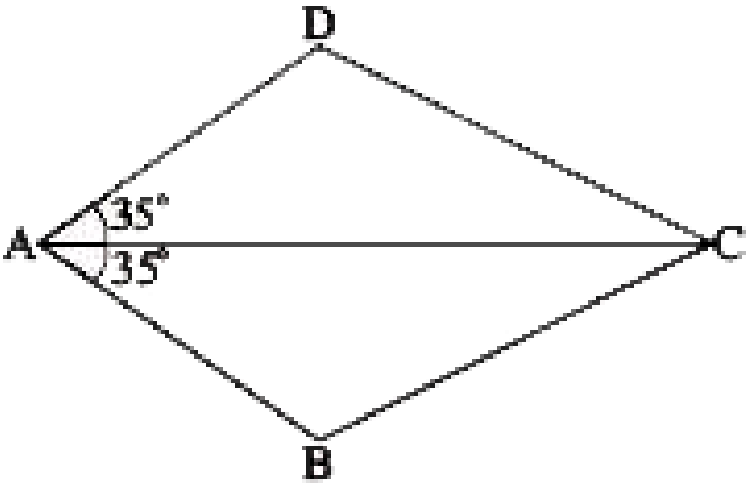
8. Which corresponding sides do we need to know to prove that the triangles are congruent using the SAS criterion?



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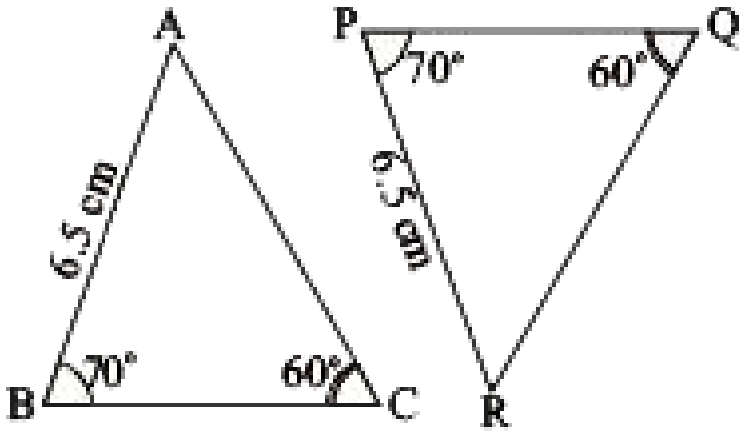
Exercise 3

1. In following pairs of triangles, find the pairs which are congruent? Also, write the criterion of congruence.



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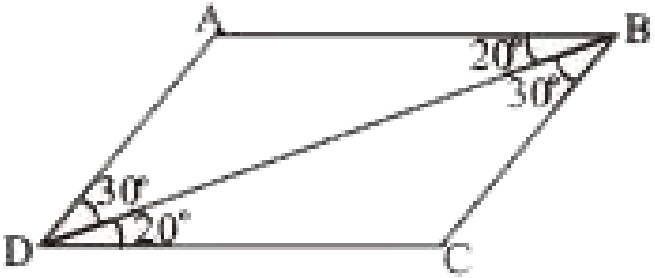
2. In following pairs of triangles, find the pairs which are congruent? Also, write the criterion of congruence.



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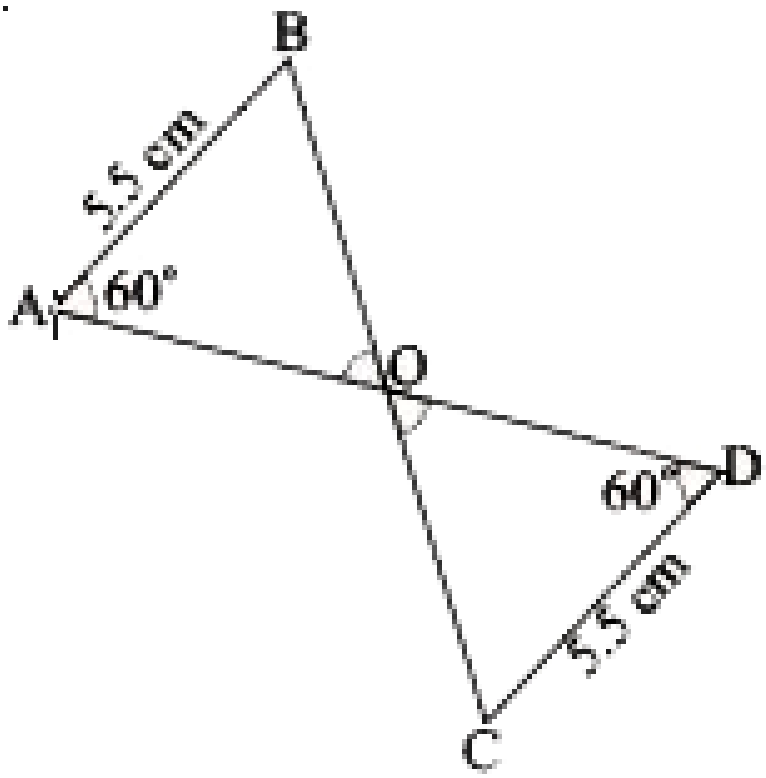
3. In following pairs of triangles, find the pairs which are congruent? Also, write the criterion of congruence.



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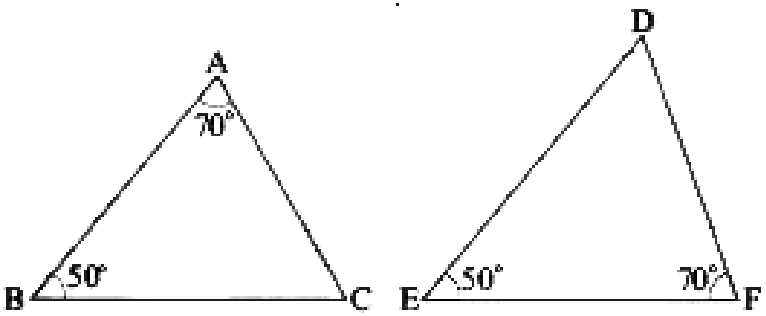
4. In following pairs of triangles, find the pairs which are congruent? Also, write the criterion of congruence.



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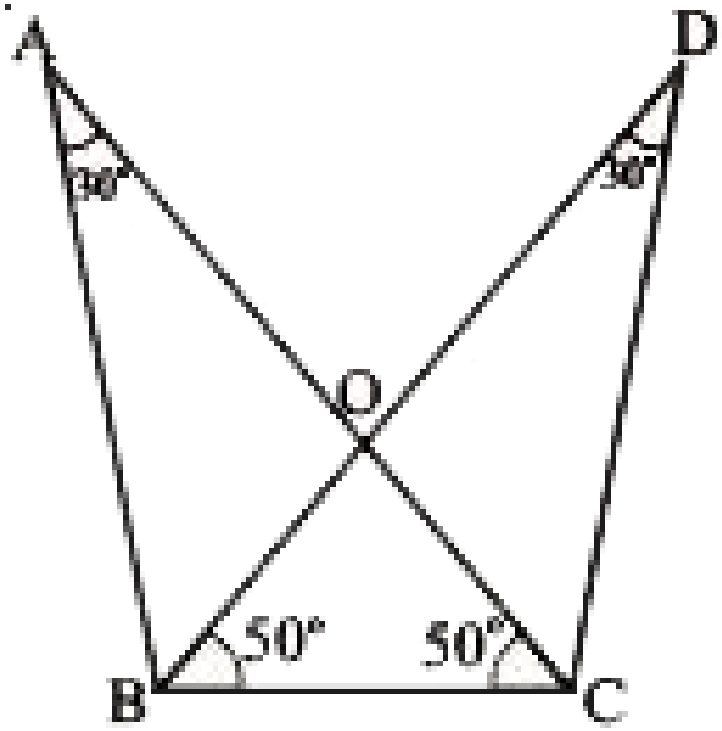
5. In the adjacent figure. Are ΔABC and ΔDCB congruent?

Also identify the relation between corresponding elements and give

reason for your answer.



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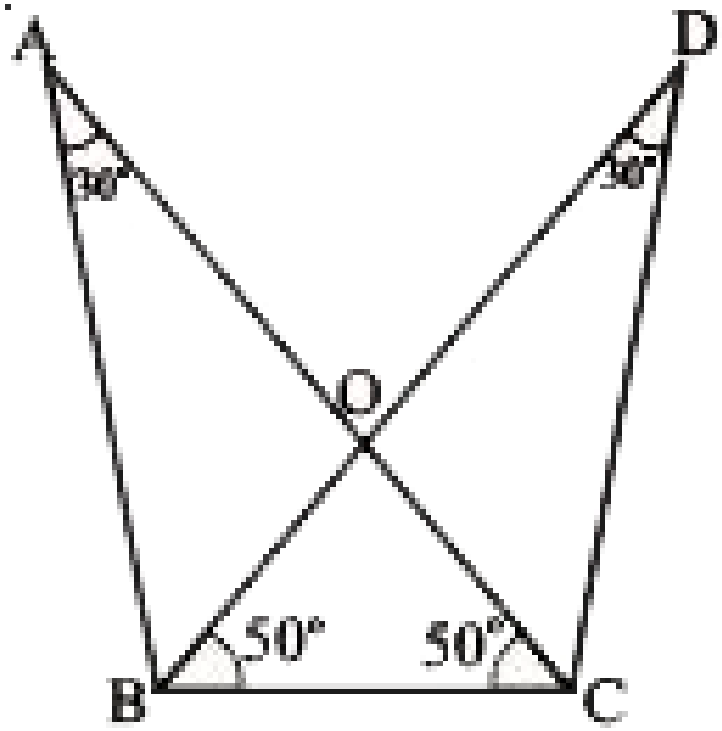

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Exercise 4

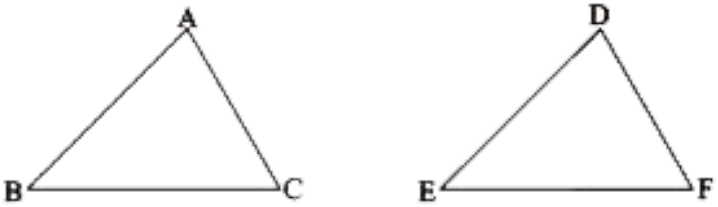
1. Which congruence criterion do you use in the following?

Given: AC= DF

AB= DE

BC= EF

So, $\Delta ABC \cong \Delta DEF$



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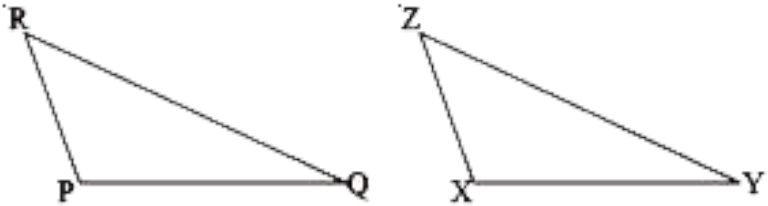
2. Which congruence criterion do you use in the following?

Given: ZX= RP

RQ = ZY

$\angle RPQ \cong \angle XZY$

So, $\Delta PQR \cong \Delta XYZ$



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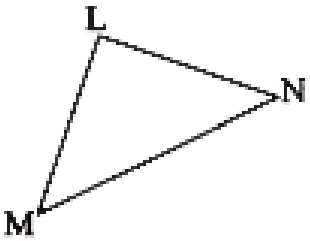
3. Which congruence criterion do you use in the following?

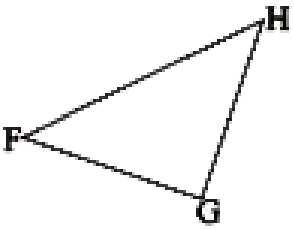
Given: $\angle MLN \cong \angle FGH$

$\angle NML \cong \angle GFH$

ML = FG

So, $\Delta LMN \cong \Delta GFH$





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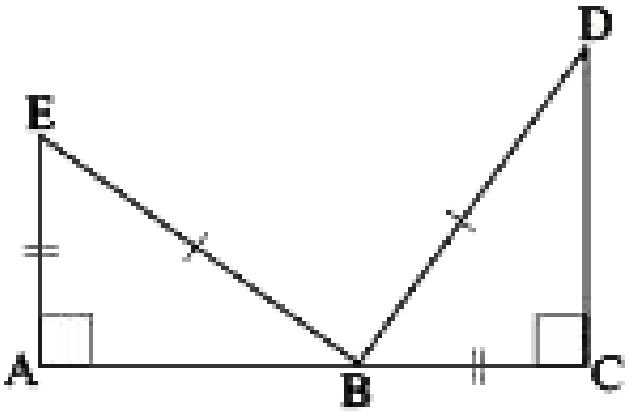
4. Which congruence criterion do you use in the following?

Given: EB= DB

AE= BC

$\angle A = \angle C = 90^\circ$

So, $\Delta ABE \cong \Delta CDB$



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5. You want to show that $\Delta ART \cong \Delta PEN$,

(i) If you have to use SSS criterion, then you need to show

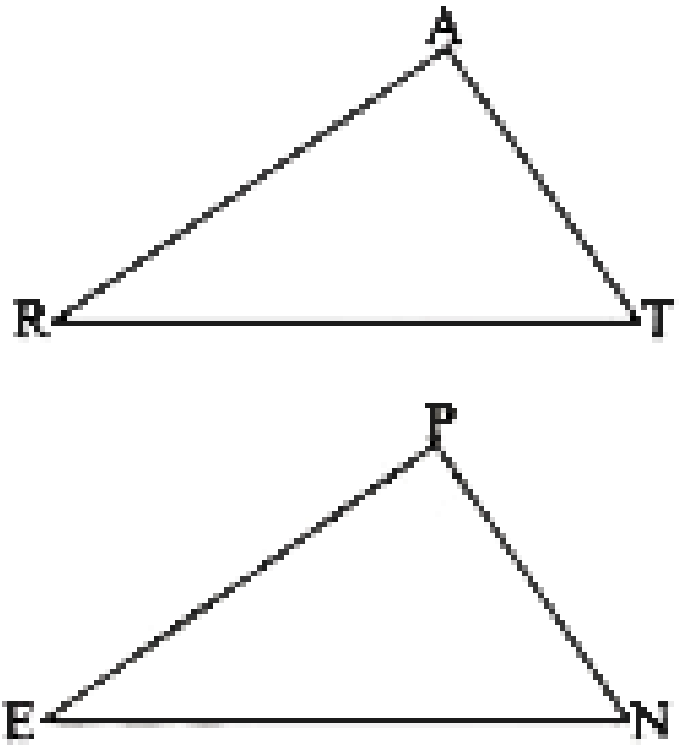
(a) AR= (b) RT= (c) AT=

(ii) If it is given that $\angle T = \angle N$ and you are to use SAS criterion, you need to have

(a) RT= and (b) PN=

(iii) If it is given that AT = PN and you are to use ASA criterion, you need to have

(a) ? (b) ?



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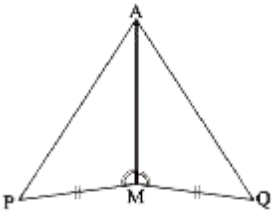
6. You have to show that $\Delta AMP \cong \Delta AMQ$.

In the following proof, supply the missing reasons.

Steps		Reasons	
(i)	PM = QM	(i)	.....
(ii)	$\angle PMA \cong \angle QMA$	(ii)	.....
(iii)	AM = AM	(iii)	.....
(iv)	$\Delta AMP \cong \Delta AMQ$	(iv)	.....



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7. In $\Delta ABC, \angle A = 30^\circ, \angle B = 40^\circ$ and $\angle C = 110^\circ$. In $\Delta PQR, \angle P = 30^\circ, \angle Q = 40^\circ$ and $\angle R = 110^\circ$. A student says that $\Delta ABC \cong \Delta PQR$ by AAA congruence criterion. Is he justified ? Why or why not?

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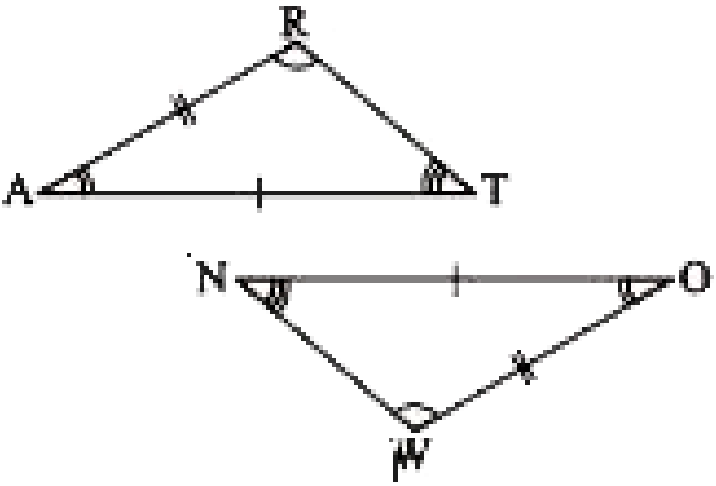
8. In the figure, the two triangles are congruent. The corresponding parts are marked. We can write $\Delta RAT \cong$?



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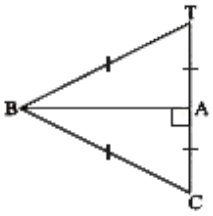
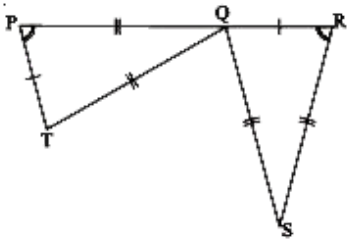
9. Complete the congruence statement.



$\Delta ABC \cong ?$



$\Delta QRS \cong ?$

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10. In a squared sheet, draw two triangles of equal areas such that the triangles are congruent

What can you say about their perimeters?

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11. In a squared sheet, draw two triangles of equal areas such that the triangles are congruent

What can you say about their perimeters?

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12. If ΔABC and ΔPQR are to be congruent, name one additional pair of corresponding parts. What criterion did you use?

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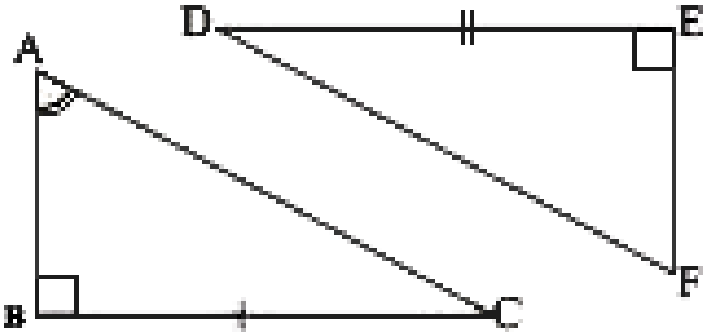
13. Explain why $\Delta ABC \cong \Delta FED$.



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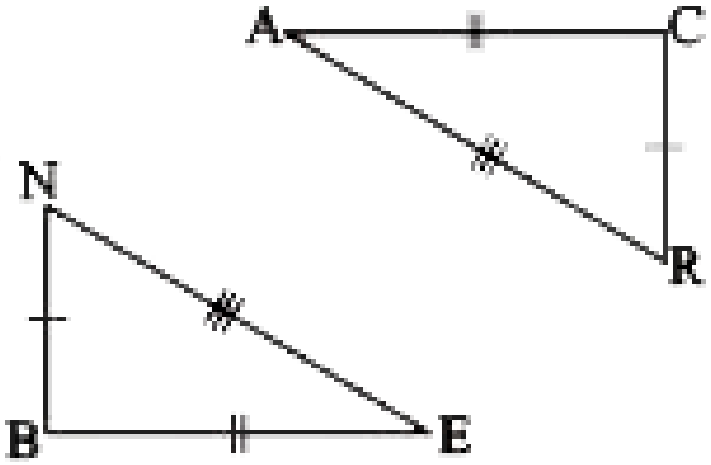
Exercise 1

1. Decide whether the SSS congruence is true with the following figures.

Give reasons



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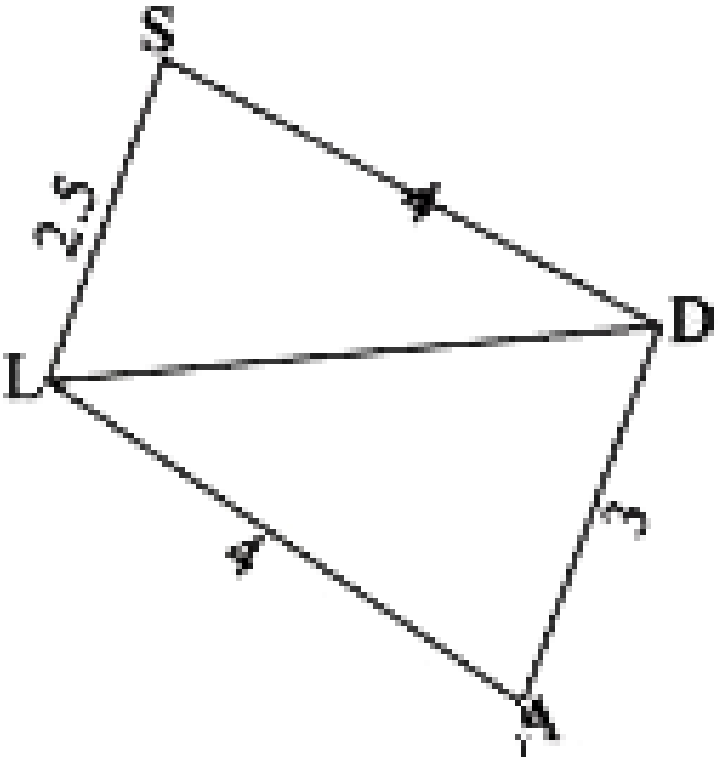
2. Decide whether the SSS congruence is true with the following figures.

Give reasons



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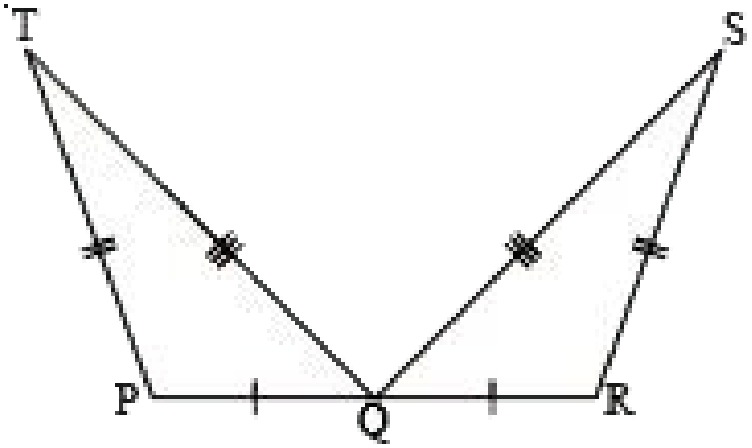
3. For the following congruent triangles, find the pairs of corresponding angles.



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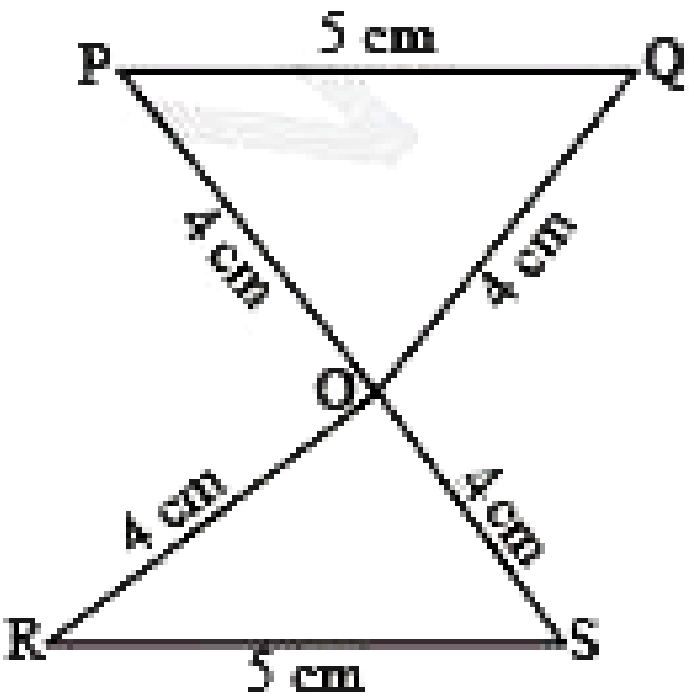
4. For the following congruent triangles, find the pairs of corresponding angles.



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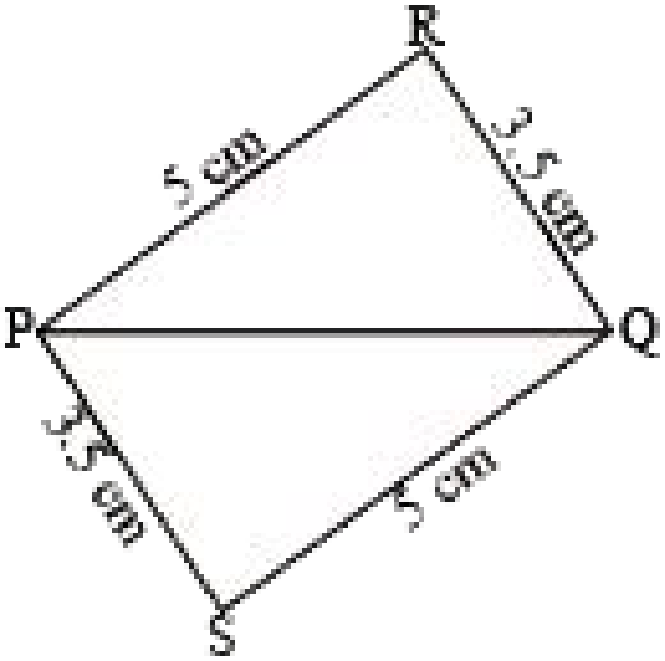
5. In adjacent figure, choose the correct answer



$\Delta PQR \cong \Delta PQS$ (ii) ΔPQR≅ΔQPS (iii) ΔPQR≅ΔSQP (iv) ΔPQR≅ΔSPQ

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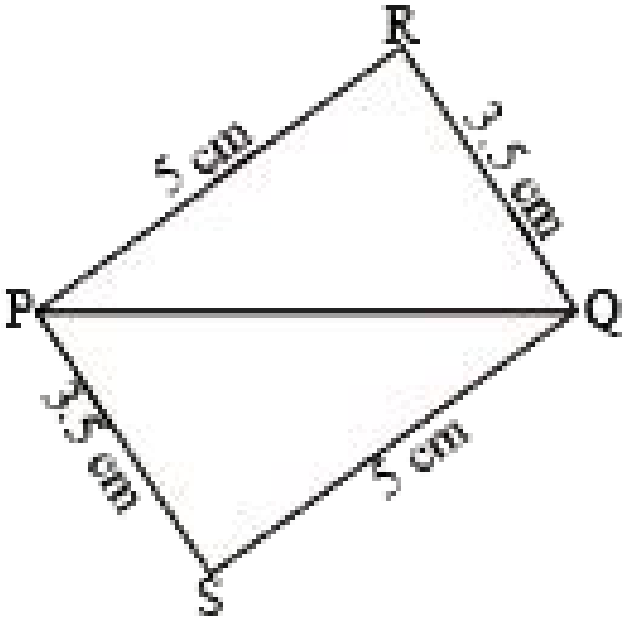
6. In adjacent figure, correct the answer



$\Delta PQR \cong \Delta QPS$

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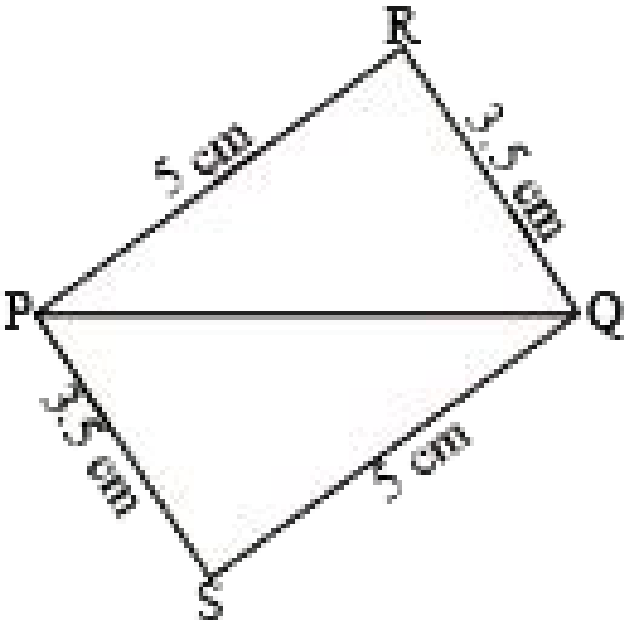
7. In adjacent figure, choose the correct answer



$\Delta PQR \cong \Delta SQP$

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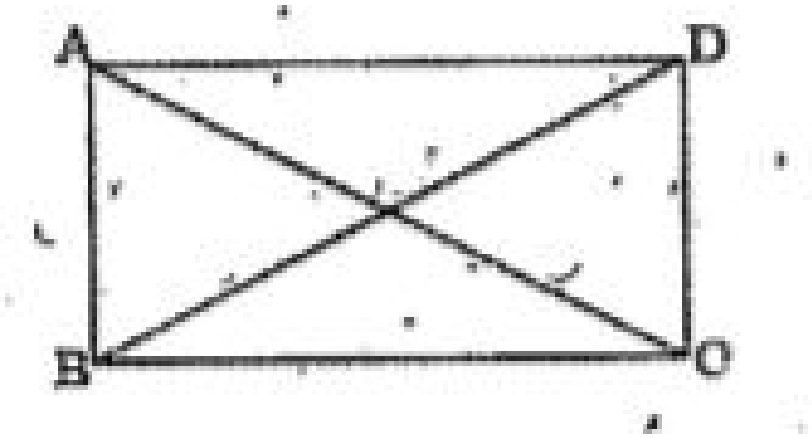
8. In the figure given below, AB= DC and AC=DB. Is $\Delta ABC \cong \Delta DCB$?



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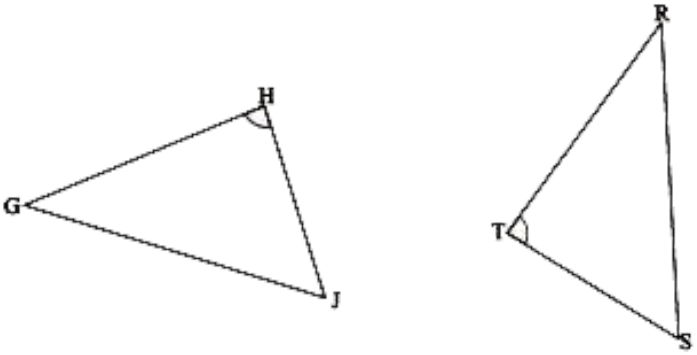
Exercise 2

1. What additional information do you need to conclude that the two triangles given here under are congruent using SAS rule?



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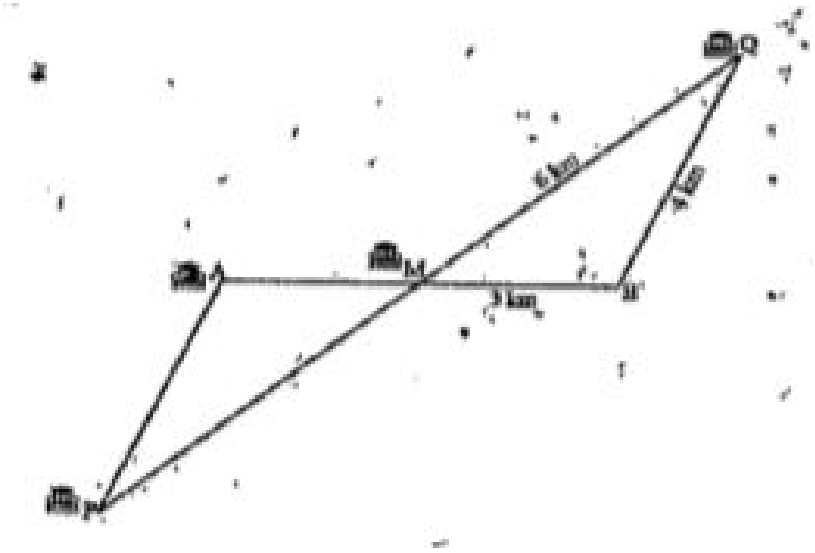
2. The map given below shows five different villages. Village M lies exactly halfway between the two pairs of villages A and B as well as P and Q. What is the distance between village A and village P. (Hint: check if $\Delta PAM \cong \Delta QBM$)



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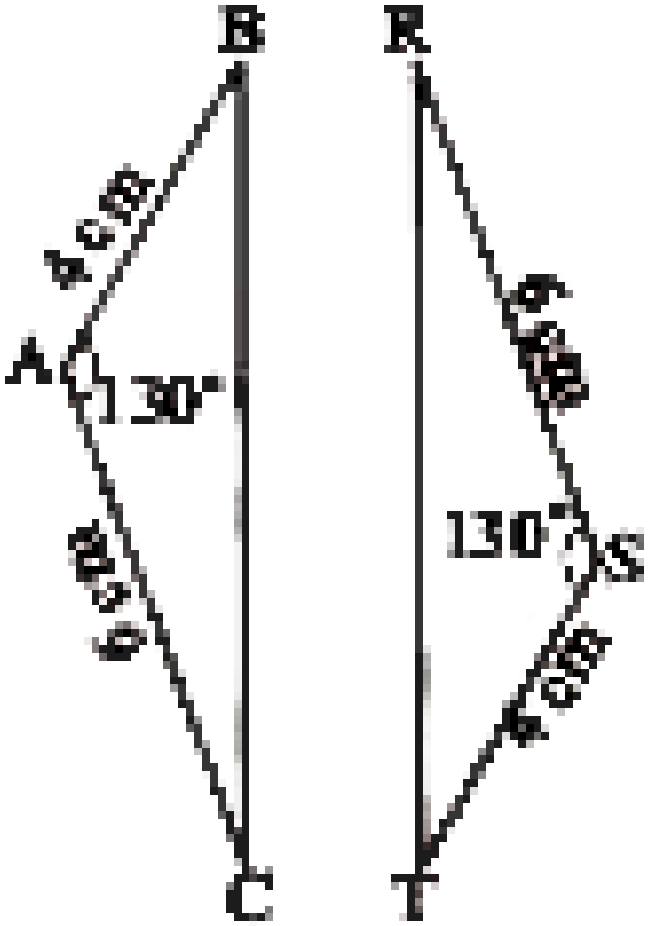
3. Look at the pairs of triangles given below. Are the congurent? If congruent write the corresponding parts.



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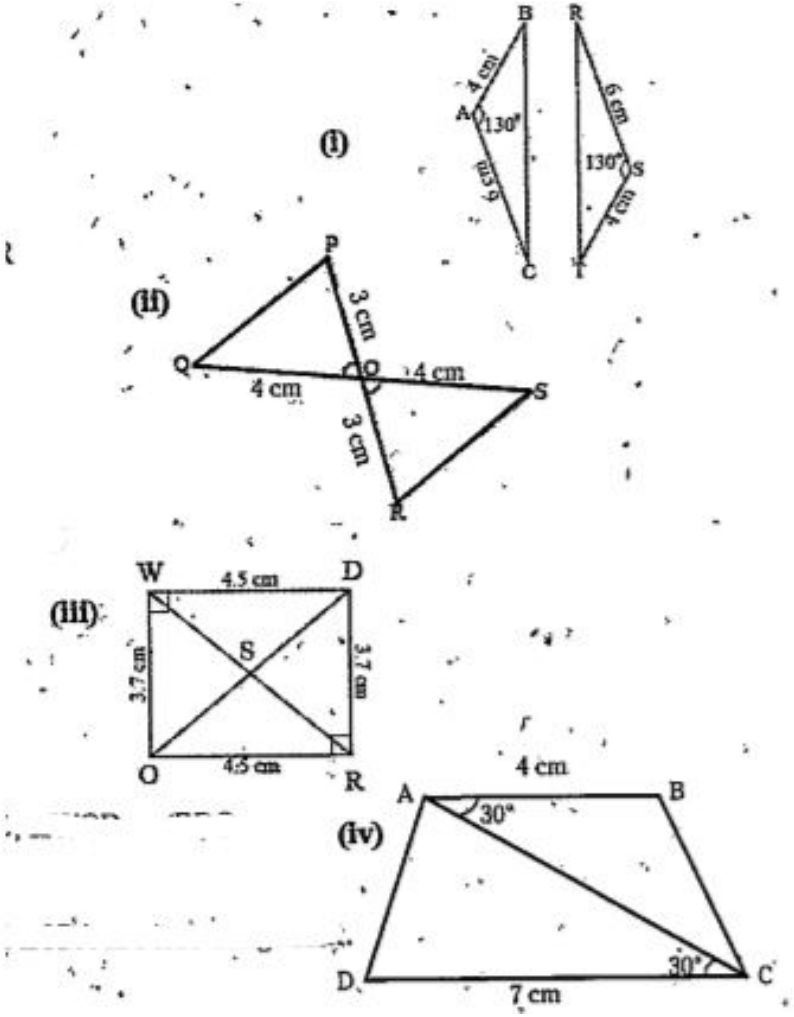
4. Look at the pairs of triangles given below. Are they congruent ? If congruent write the corresponding parts.



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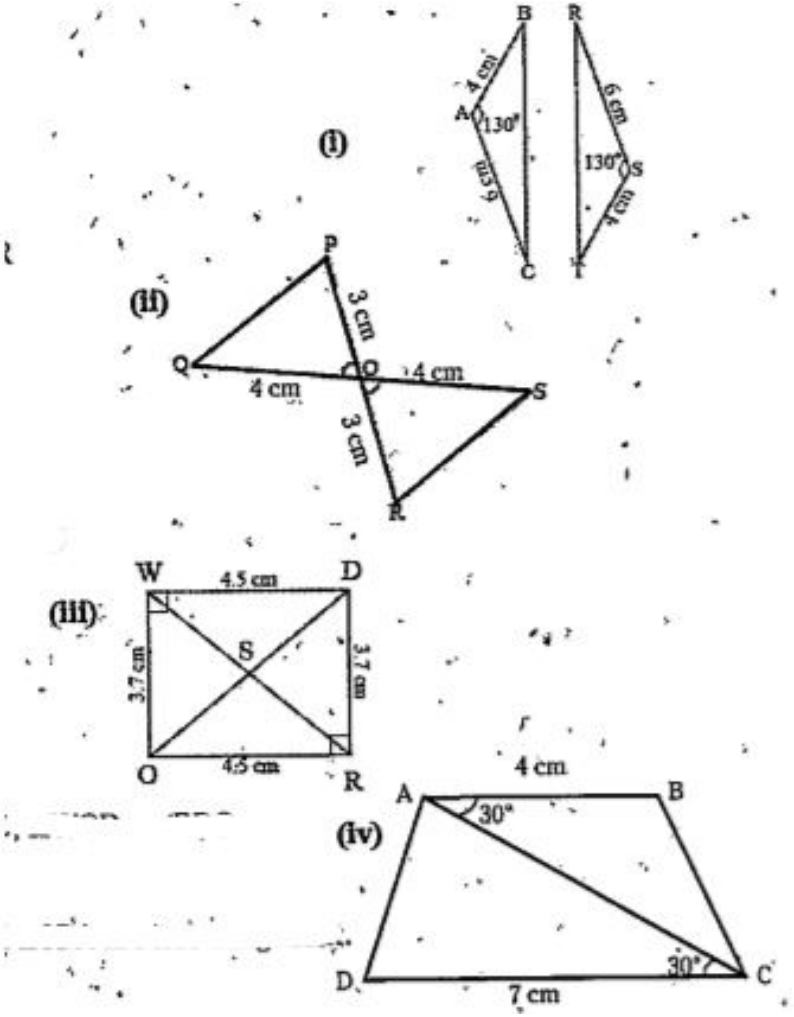
5. Look at the pairs of triangles given below. Are they congruent ? If congruent write the corresponding parts.



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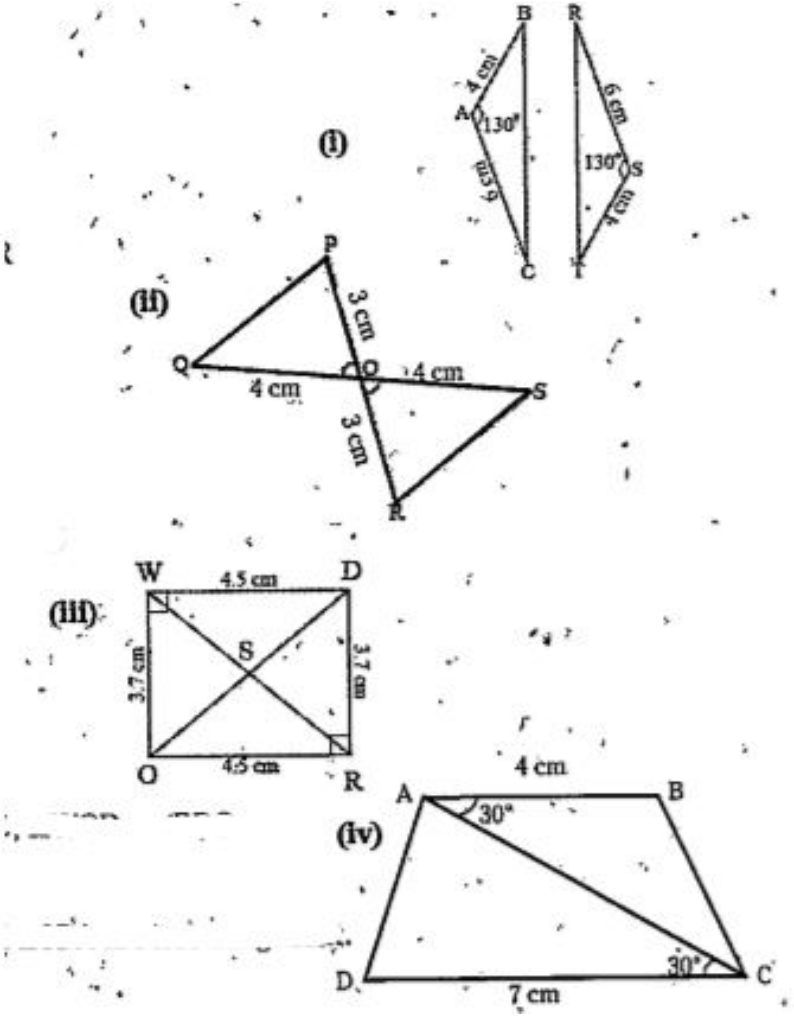
6. Look at the pairs of triangles given below. Are they congruent ? If congruent write the corresponding parts.



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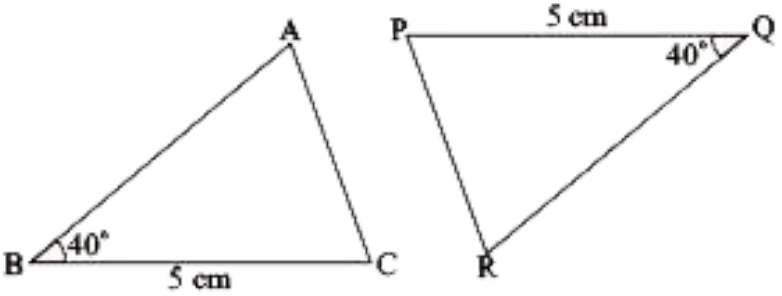
7. Which corresponding sides do we need to know to prove that the triangles are congruent using the SAS criterion?



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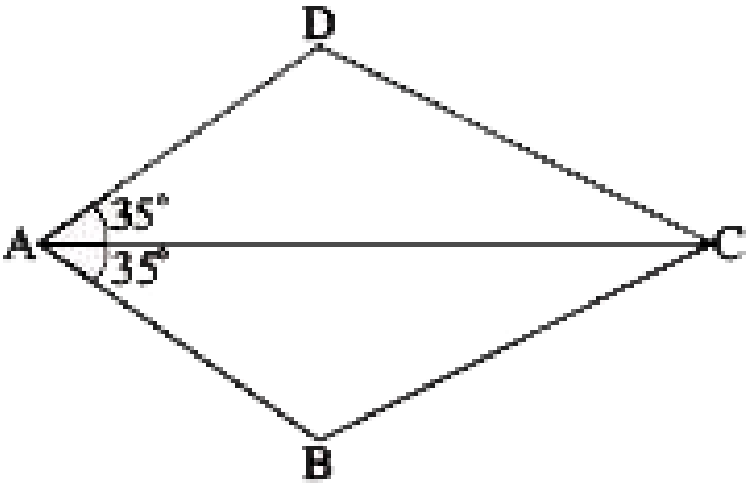

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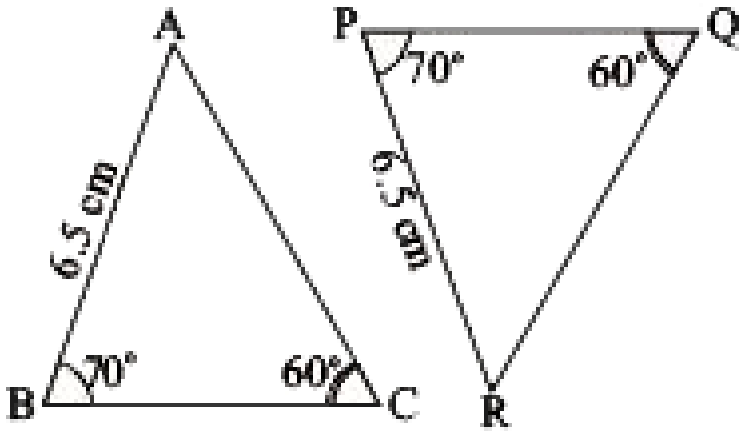
Exerciese 3

1. In following pairs of triangles, find the pairs which are congruent? Also, write the criterion of congruence.



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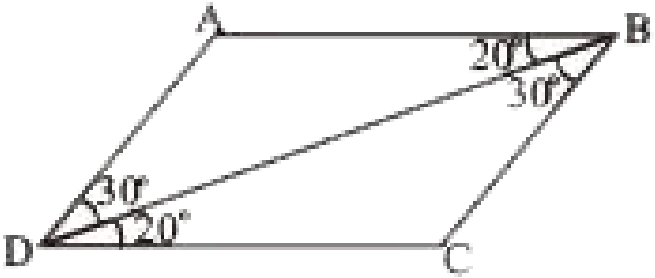
2. In following pairs of triangles, find the pairs which are congruent? Also, write the criterion of congruence.



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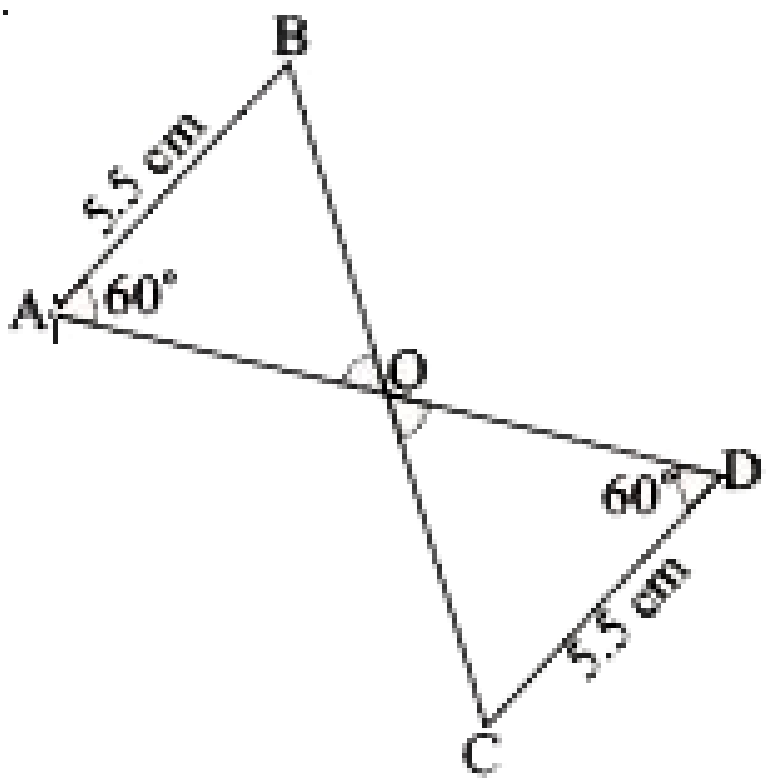

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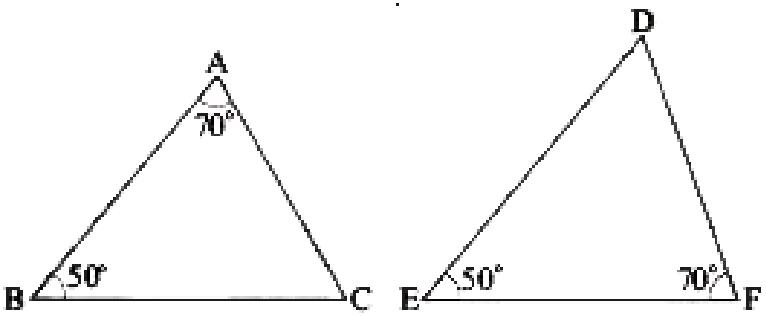
4. In following pairs of triangles, find the pairs which are congruent? Also, write the criterion of congruence.



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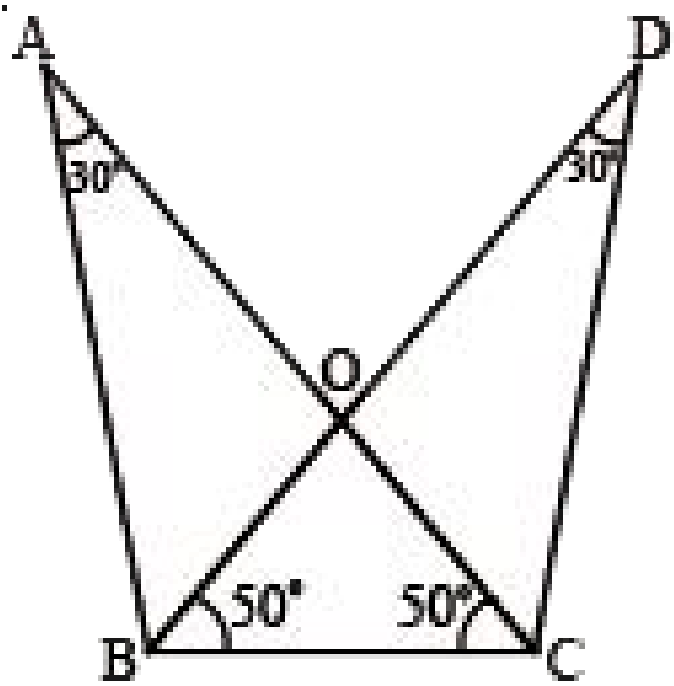
5. In the adjacent figure

(i) Are ΔABC and ΔDCB congruent ?

(ii) Are ΔAOB congruent to ΔDOC ?

Also identify the relation between corresponding elements and give

reason for your answer



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Exerciese 4

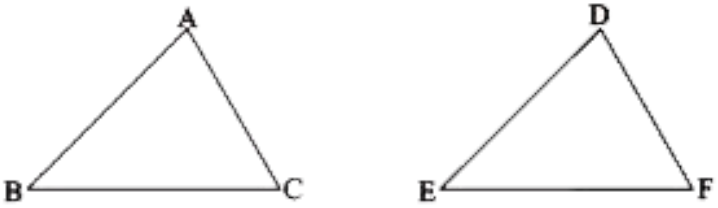
1. Which congruence criterion do you use in the following?

Given: AC= DF

AB= DE

BC= EF

So, $\Delta ABC \cong \Delta DEF$



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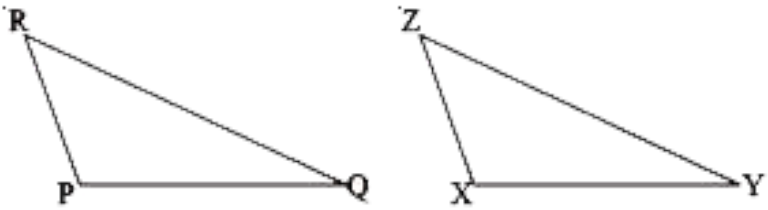
2. Which congruence criterion do you use in the following?

Given: ZX= RP

RQ = ZY

$\angle RPQ \cong \angle XZY$

So, $\Delta PQR \cong \Delta XYZ$



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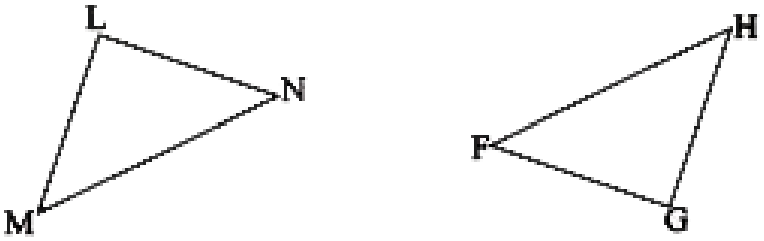
3. Which congruence criterion do you use in the following?

Given: $\angle MLN \cong \angle FGH$

$\angle NML \cong \angle GFH$

ML = FG

So, $\Delta LMN \cong \Delta GFH$



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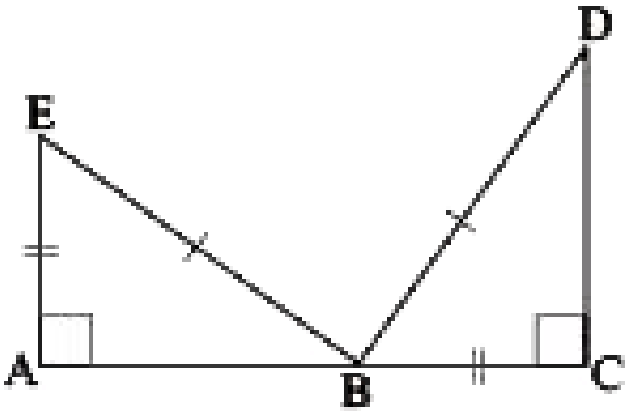
4. Which congruence criterion do you use in the following?

Given: EB= DB

AE= BC

$\angle A = \angle C = 90^\circ$

So, $\Delta ABE \cong \Delta CDB$



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5. You want to show that $\Delta ART \cong \Delta PEN$,

(i) If you have to use SSS criterion, then you need to show

(a) AR= (b) RT= (c) AT=

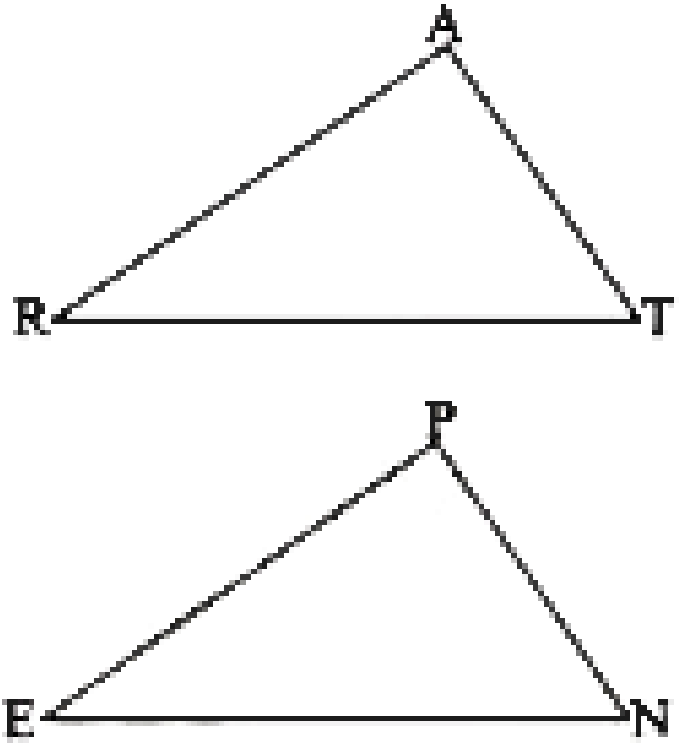
(ii) If it is given that $\angle T = \angle N$ and you are to use SAS criterion, you need

to have

(a) RT= and (b) PN=

(iii) If it is given that AT = PN and you are to use ASA criterion, you need to have

(a) ? (b) ?



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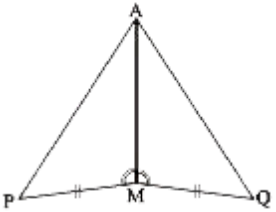
6. You have to show that $\Delta AMP \cong \Delta AMQ$.

In the following proof, supply the missing reasons.

Steps	Reasons
(i) PM = QM	(i) .....
(ii) $\angle$PMA $\cong$ $\angle$QMA	(ii) .....
(iii) AM = AM	(iii) .....
(iv) ΔAMP $\cong$ ΔAMQ	(iv) .....



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7. In $\Delta ABC, \angle A = 30^\circ, \angle B = 40^\circ$ and $\angle C = 110^\circ$. In $\Delta PQR, \angle P = 30^\circ, \angle Q = 40^\circ$ and $\angle R = 110^\circ$. A student says that $\Delta ABC \cong \Delta PQR$ by AAA congruence criterion. Is he justified ? Why or why not?

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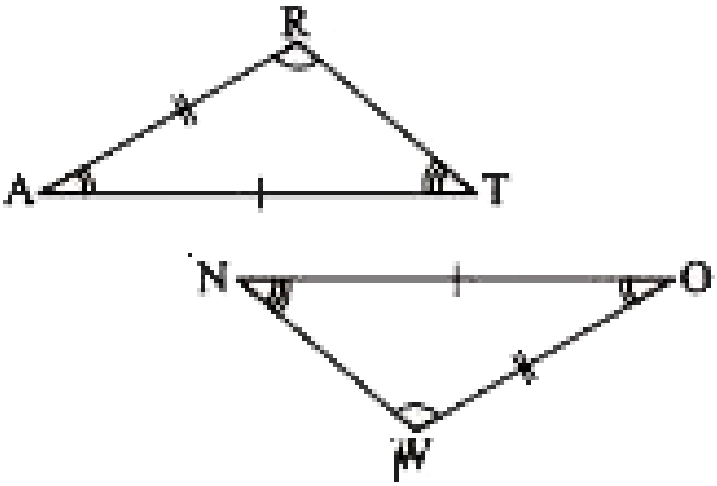
8. In the figure, the two triangles are congruent. The corresponding parts are marked. We can write $\Delta RAT \cong$?



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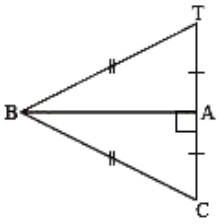
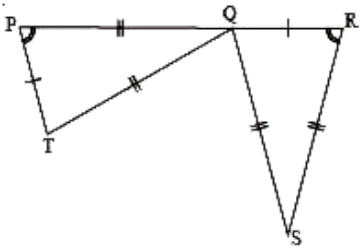


$\Delta ABC \cong ?$



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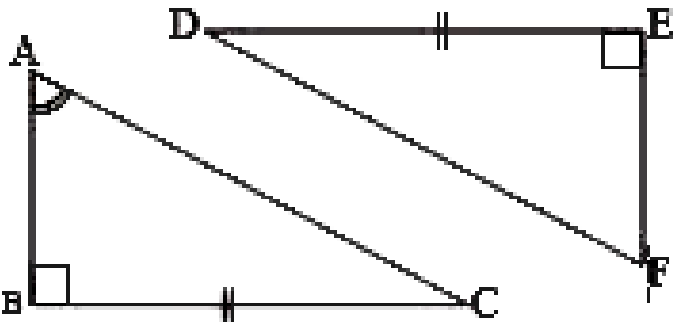

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