MATHS

BOOKS - PSEB

CONGRUENCE OF TRIANGLES

Example

1. $\triangle ABC$ and $\triangle PQR$ are congruent under the correspondence:

$ABC \leftrightarrow RQP$

Write the parts of $\triangle ABC$ that correspond to

$\overline{PQ}$

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2. $\triangle ABC$ and $\triangle PQR$ are congruent under the correspondence:

$ABC \leftrightarrow RQP$

Write the parts of $\triangle ABC$ that correspond to

$\angle Q$

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3. $\triangle ABC$ and $\triangle PQR$ are congruent under the correspondence:

$ABC \leftrightarrow RQP$

Write the parts of $\triangle ABC$ that correspond to

$\overline{R}P$

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4. When two triangles, say ABC and PQR are given, there are, in all, six possible matchings or correspondences. Two of them are

(i) ABC PQR and (ii) ABC QRP.

Find the other four correspondences by using two cutouts of triangles. Will all these correspondences lead to congruence? Think about it.

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5. Complete the following statements:

Two line segments are congruent if _____.

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6. Complete the following statements:

Among two congruent angles, one has a measure of 70°, the measure of the other angle is _____.

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7. Complete the following statements:

When we write $\angle A = \angle B$, we actually mean_____.

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8. Give any two real-life examples for congruent shapes.

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9. If $\triangle ABC \cong \triangle FED$ under the correspondence $ABC \leftrightarrow FED$, write all the corresponding congruent parts of the triangles.

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10. In $\triangle DEF \cong \triangle BCA$, write the part(s) of $\triangle BCA$ that correspond to $\angle E$

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11. In $\triangle DEF \cong \triangle BCA$, write the part(s) of $\triangle BCA$ that correspond to $\overline{EF}$

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12. In $\triangle DEF \cong \triangle BCA$, write the part(s) of $\triangle BCA$ that correspond to $\angle F$

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13. In $\triangle DEF \cong \triangle BCA$, write the part(s) of $\triangle BCA$ that correspond to $\overline{DF}$

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14. In triangles ABC and PQR, AB = 3.5 cm, BC = 7.1 cm, AC = 5 cm, PQ = 7.1 cm, QR = 5 cm and PR = 3.5 cm. Examine whether the two triangles are congruent or not. If yes, write the

congruence relation in symbolic form.

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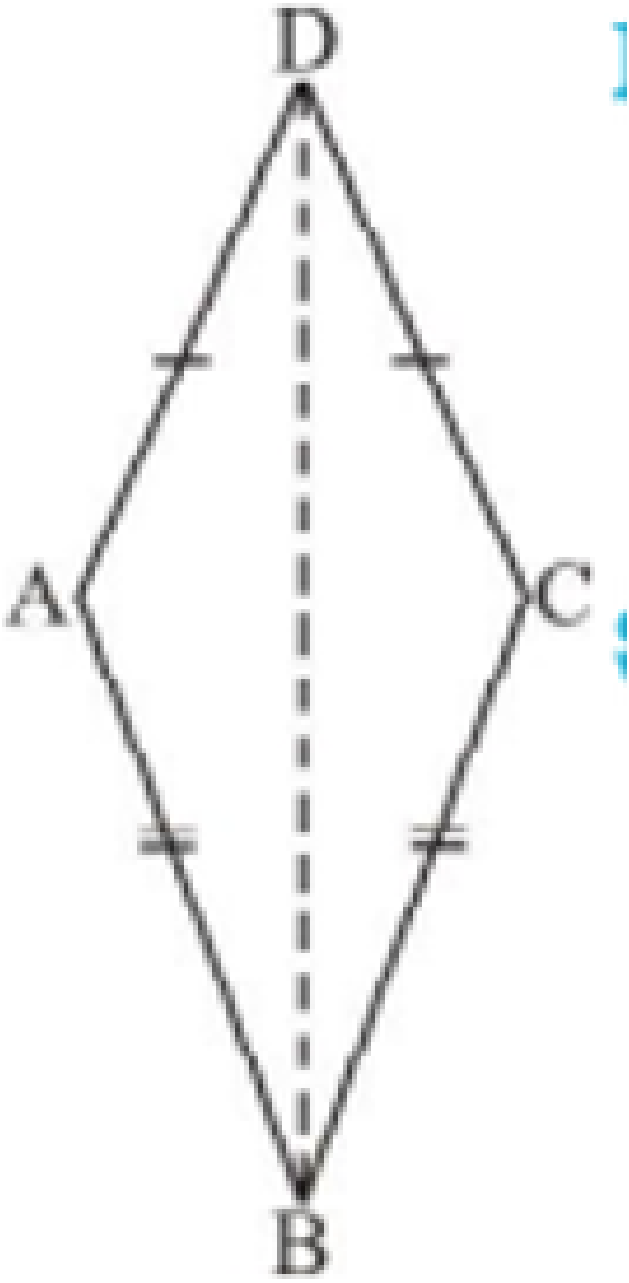
15. In fig Ad = CD and AB = CB.

State the three pairs of equal parts in

$\triangle ABD$ and $\triangle CBD$.


D
A
C
B

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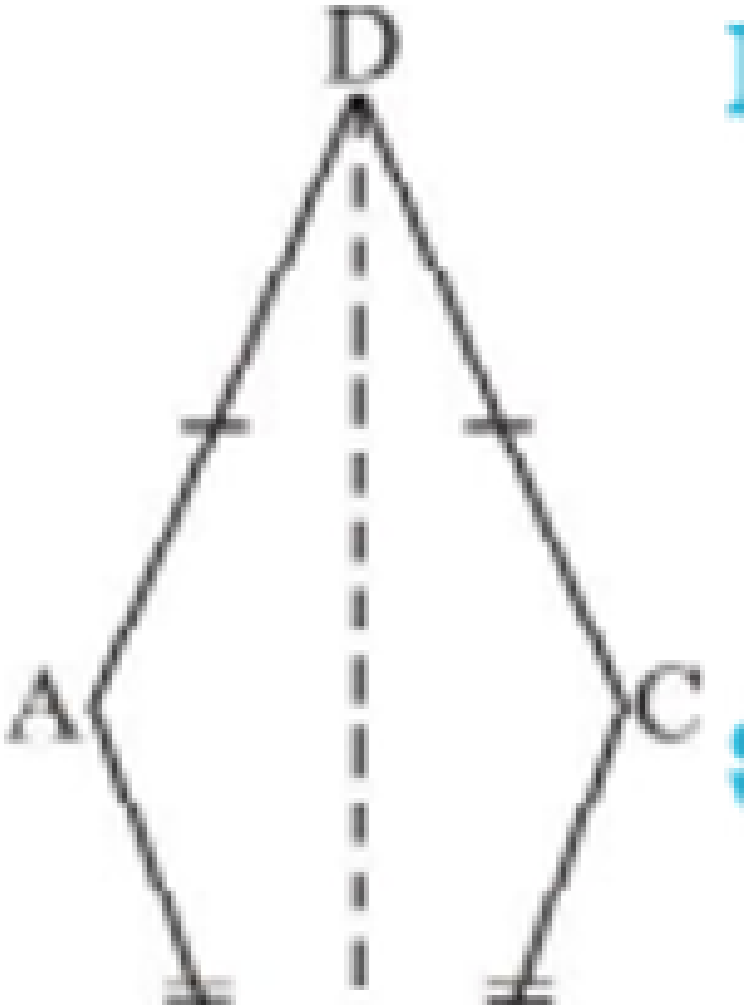
16. In fig Ad = CD and AB = CB.

Is $\triangle ABD \cong \triangle CBD$? Why or why not?



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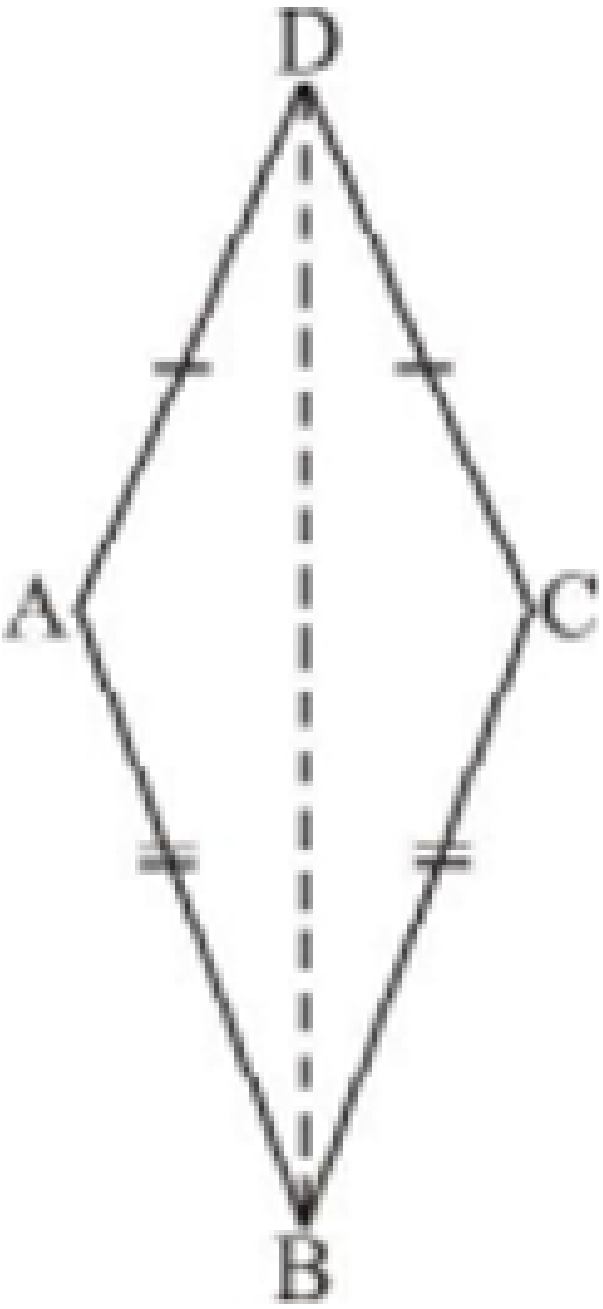
17. In fig Ad = CD and AB = CB.

Does BD bisect $\angle ABC$? Give reasons.


D
A
C
B

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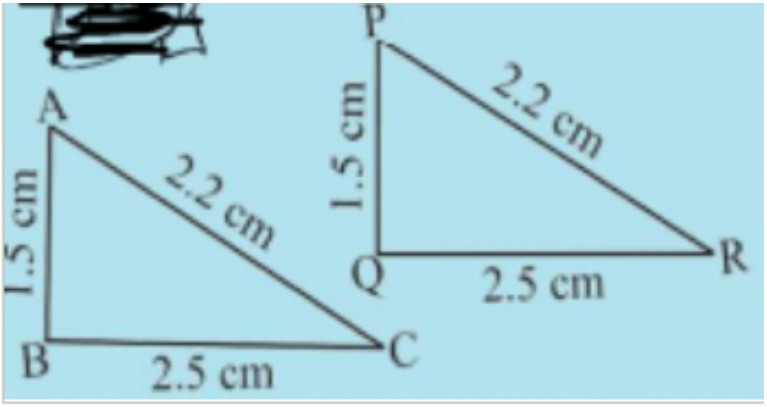
18. In Fig, lengths of the sides of the triangles are indicated. By applying the SSS congruence rule, state which pairs of triangles are congruent. In case of congruent triangles, write the result in symbolic form:



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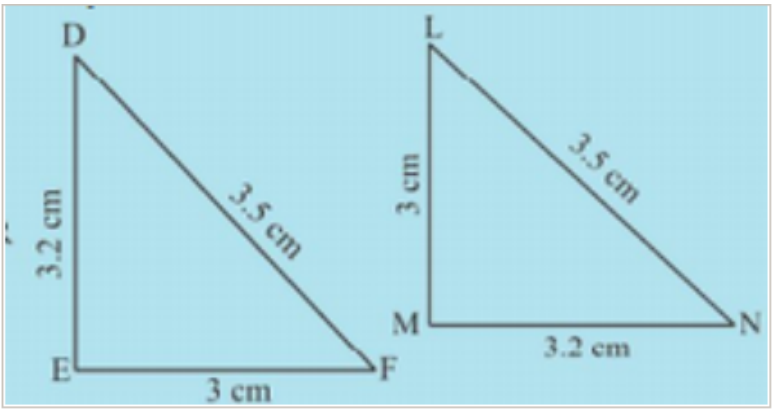

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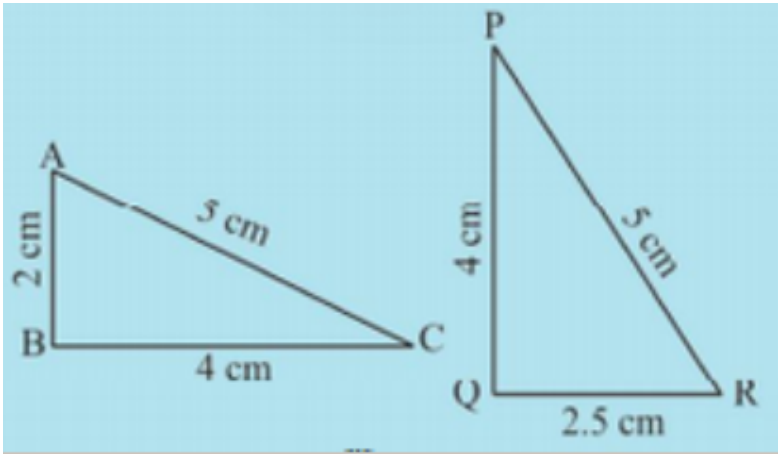

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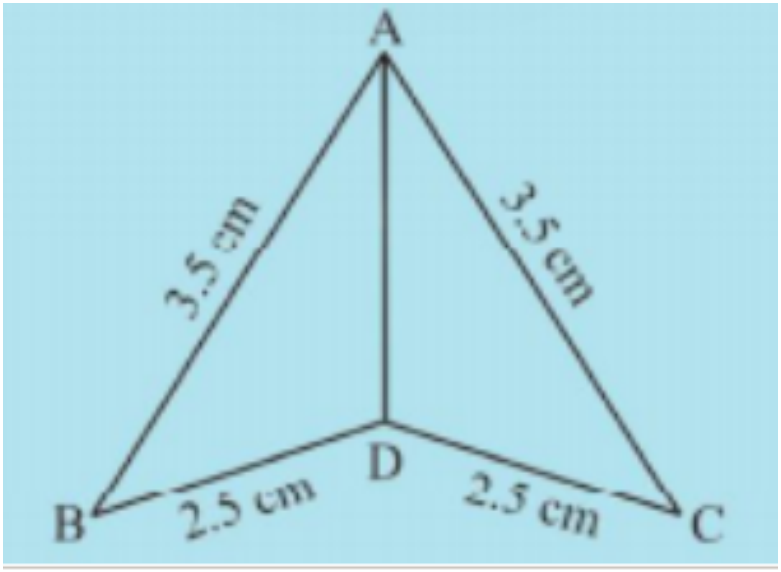
21. In Fig, lengths of the sides of the triangles are indicated. By applying the SSS congruence rule, state which pairs of triangles are congruent. In case of congruent triangles, write the result in symbolic form:



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22. In Fig, AB = AC and D is the mid-point of $\overline{B}C$.

State the three pairs of equal parts in $\triangle ADB$ and $\triangle ADC$.

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23. In Fig, AB = AC and D is the mid-point of $\overline{B}C$.

Is $\triangle ADB \cong \triangle ADC$? Give reasons.

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24. In Fig, AB = AC and D is the mid-point of $\overline{B}C.$

Is $\angle B = \angle C$? Why?

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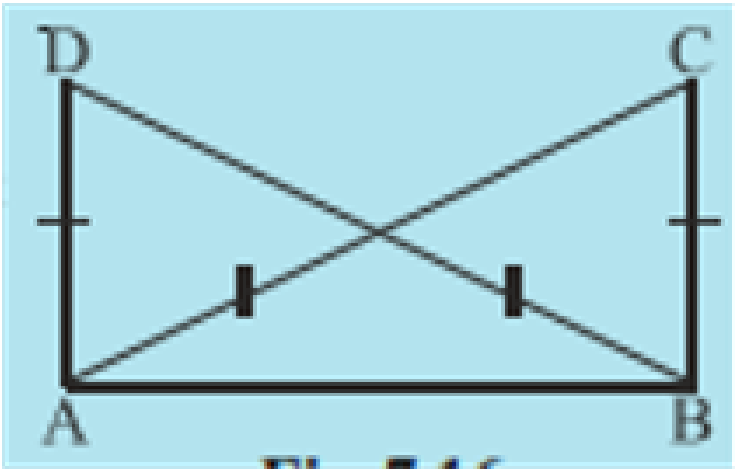
25. In Fig, Ac = BD and AD = BC. Which of the following statements is meaningfully written?



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26. ABC is an isosceles triangle with AB = AC.Take a trace-copy of ABC and also name it as ABC.

State the three parts of equal parts in $\triangle ABC$ and $\triangle ACB$.

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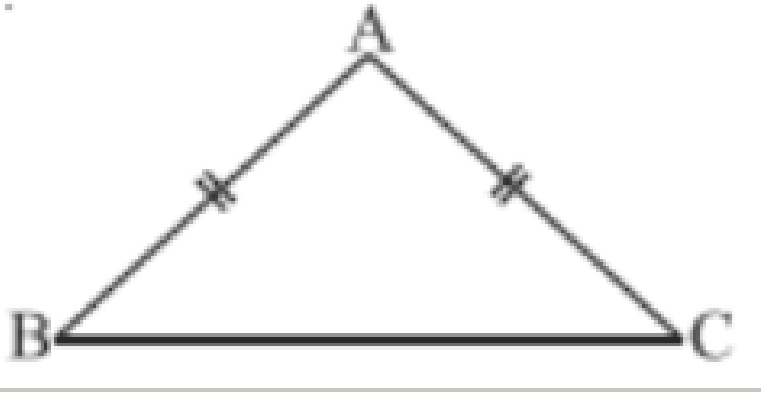
27. ABC is an isosceles triangle with AB = AC.Take a trace-copy of ABC and also name it as ABC.



Is $\angle B = \angle C$? Why or why not?

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28. Given below are measurements of some parts of two triangles. Examine whether the two triangles are congruent or not, by using SAS congruence rule. If the triangles are congruent, write them in symbolic form.

	ΔABC	ΔDEF
(a)	$AB = 7$ cm, $BC = 5$ cm, $\angle B = 50°$	$DE = 5$ cm, $EF = 7$ cm, $\angle E = 50°$
(b)	$AB = 4.5$ cm, $AC = 4$ cm, $\angle A = 60°$	$DE = 4$ cm, $FD = 4.5$ cm, $\angle D = 55°$
(c)	$BC = 6$ cm, $AC = 4$ cm, $\angle B = 35°$	$DF = 4$ cm, $EF = 6$ cm, $\angle E = 35°$

(It will be always helpful to draw a rough figure, mark the measuremants and then probe the question).

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29. In Fig AB = AC and AD is the bisector of $\angle BAC$.

State three pairs of equal parts in triangles ADB and ADC.

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30. In Fig AB = AC and AD is the bisector of $\angle BAC$.

Is $\triangle ADB \cong \triangle ADC$? Give reasons.

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31. In Fig AB = AC and AD is the bisector of $\angle BAC$.

Is $\angle B = \angle C$? Give reasons.

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32. Which angle is included between the sides $\overline{DE}$ and $\overline{EF}$ of $\triangle DEF$?

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33. By applying SAS congruence rule, you want to establish that $\triangle PQR \cong \triangle FED$. It is given that PQ = FE and RP = DF. What additional information is needed to establish the congruence?

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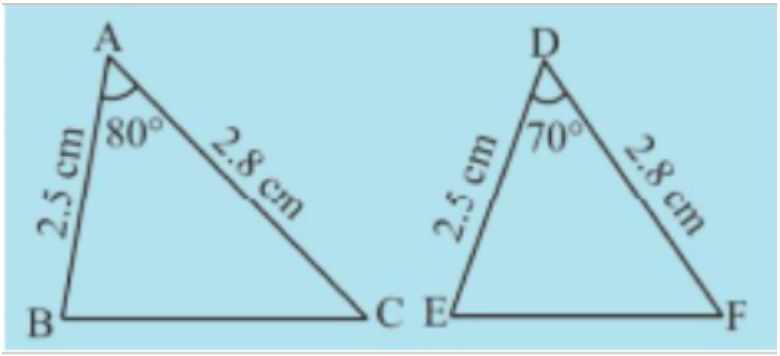
34. In Fig , measures of some parts of the triangles are indicated. By applying SAS

congruence rule, state the pairs of congruent triangles, if any, in each case. In case of congruent triangles, write them in symbolic form.



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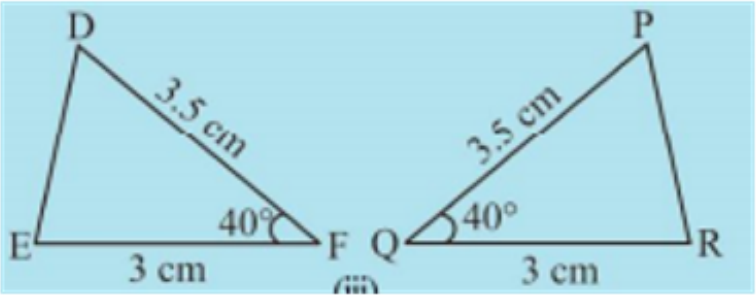

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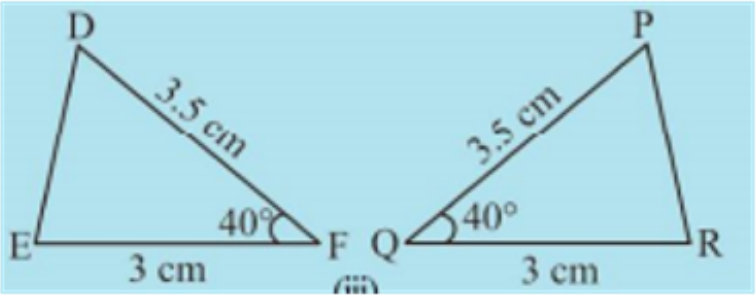

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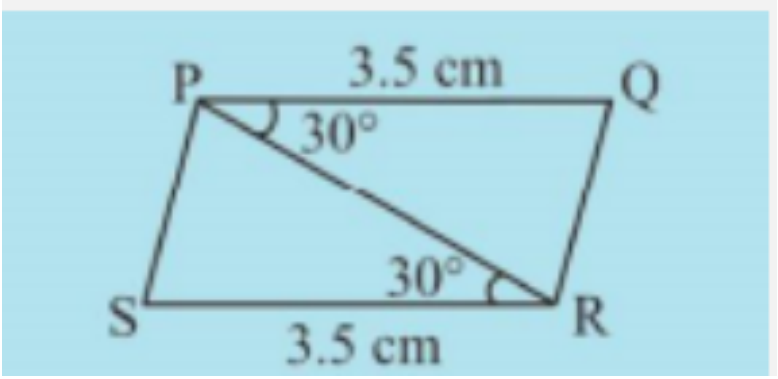

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38. In Fig $\overline{A}B$ and $\overline{C}D$ bisect each other at O.

State the three pairs of equal parts in two triangles AOC and BOD.

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39. In Fig $\overline{A}B$ and $\overline{C}D$ bisect each other at O.

Which of the following statements are true?

$\triangle AOC \cong \triangle DOB$

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40. In Fig $\overline{A}B$ and $\overline{C}D$ bisect each other at O.

Which of the following statements are true?

$\triangle AOC \cong \triangle BOD$

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41. By applying ASA congruence rule, it is to be established that $\triangle ABC \cong \triangle QRP$ and it is given that BC = RP. What additional

information is needed to establish the congruence?

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42. In Fig,can you use ASA congruence rule and conclude that $\triangle AOC \cong \triangle BOD$?

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43. What is the side included between the angles M and N of $\triangle MNP$?

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44. You want to establish $\triangle DEF \cong \triangle MNP$, using the ASA congruence rule. You are given that $\angle D = \angle M$ and $\angle F = \angle P$. What information is needed to establish the congruence? (Draw a rough figure and then try!

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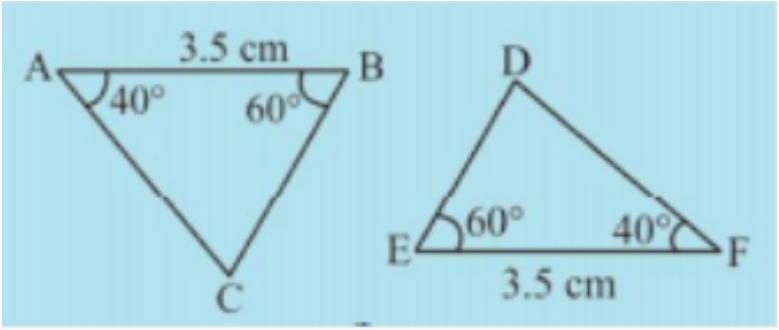
45. In Fig, measures of some parts are indicated. By applying ASA congruence rule, state which paris of triangles are congruent. In case of congruence write the result in symoblic form.



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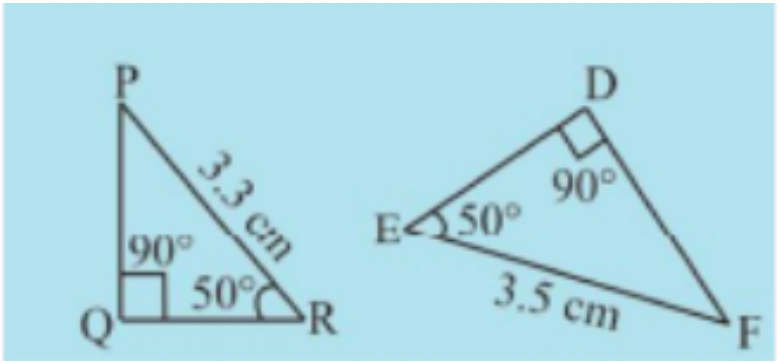

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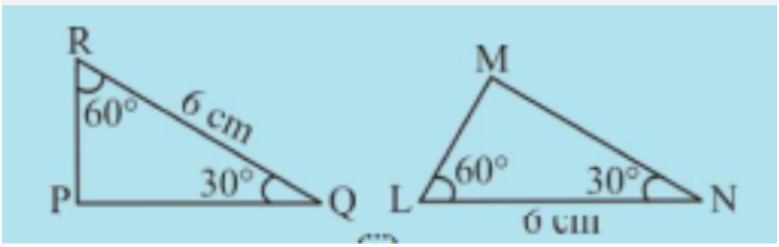

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48. In Fig, measures of some parts are indicated. By applying ASA congruence rule, state which paris of triangles are congruent. In case of congruence write the result in symoblic form.

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49. Given below are measurements of some parts of two triangles Examine whether the two triangles are congruent or not, by ASA

congruence rule. In case of congruence, write it in symbolic form.

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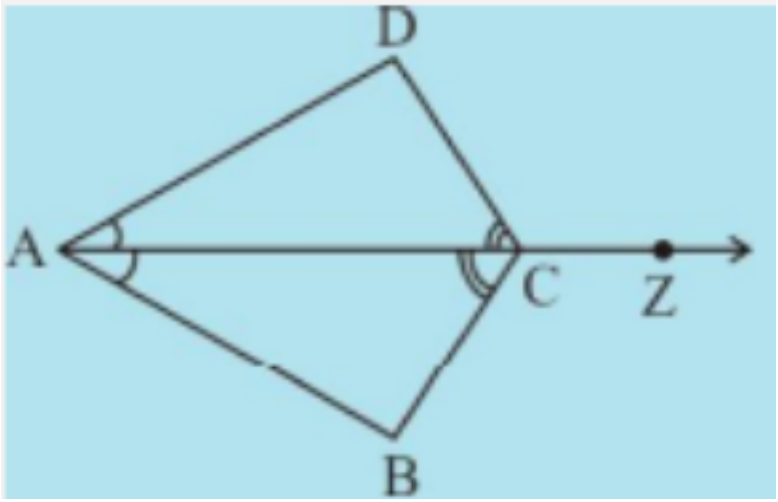
50. In Fig, ray AZ bisects $\angle DAB$ as well as $\angle DCB$.

State the three pairs of equal parts in

triangles BAC and DAC.



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51. In Fig, ray AZ bisects $\angle DAB$ as well as $\angle DCB$.

Is $\triangle BAC \cong \triangle DAC$? Give reasons.

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52. In Fig, ray AZ bisects $\angle DAB$ as well as $\angle DCB$.

Is AB = AD? Justify you answer.

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53. In Fig, ray AZ bisects $\angle DAB$ as well as $\angle DCB$.

Is CD = CB? Give reasons.

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54. Solve

$x^2 - 7x + 6 = 0$

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55. In Fig, $DA \perp AB, CB \perp AB$ and AC = BD. State the three pairs of equal parts in $\triangle ABC$ and $\triangle DAB$. Which of the

following statements is meaningful?

$\triangle ABC \cong \triangle BAD$

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56. In Fig, $DA \perp AB, CB \perp AB$ and AC = BD. State the three pairs of equal parts in $\triangle ABC$ and $\triangle DAB$. Which of the following statements is meaningful?

$\triangle ABC \cong \triangle ABD$

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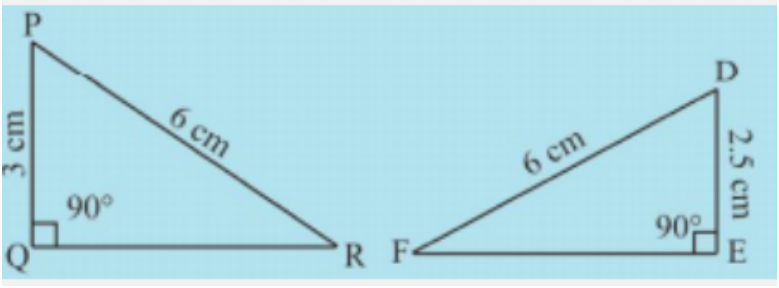
57. In Fig measures of some parts of triangles are given. By applying RHS congruence rule, state which pairs of triangles are congruent. In case of congruent traingles, write the result in symbolic form.



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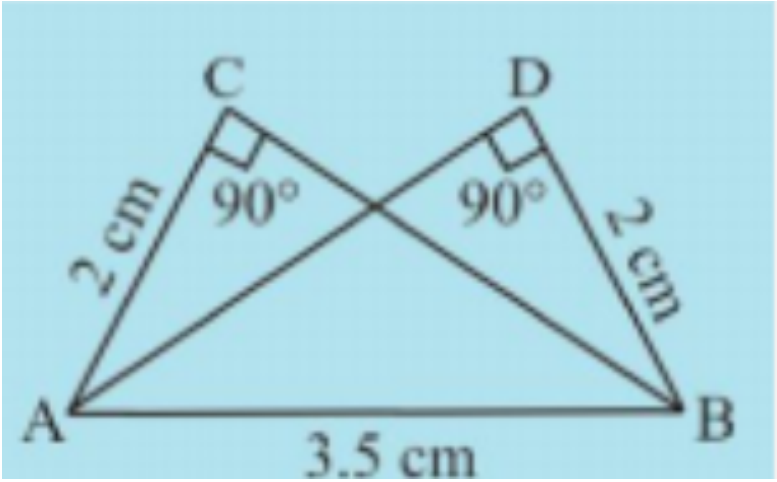

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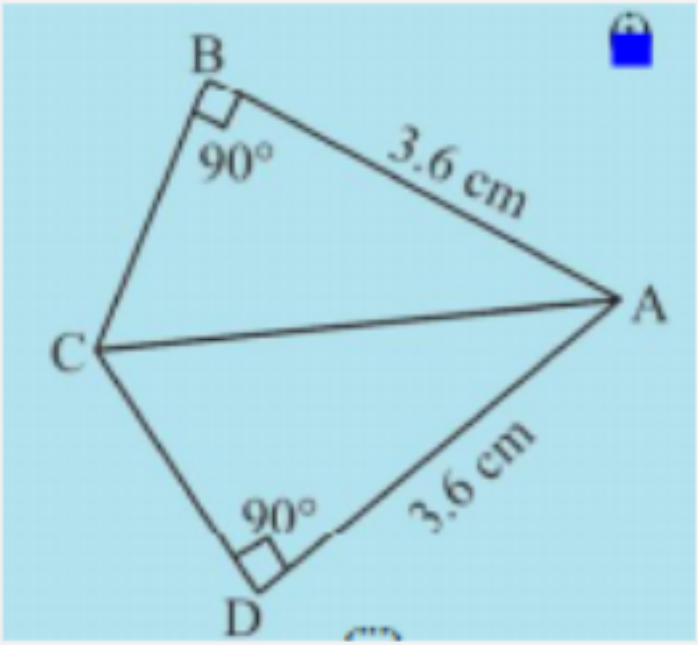
59. In Fig measures of some parts of triangles are given. By applying RHS congruence rule, state which pairs of triangles are congruent. In case of congruent traingles, write the result in symbolic form.



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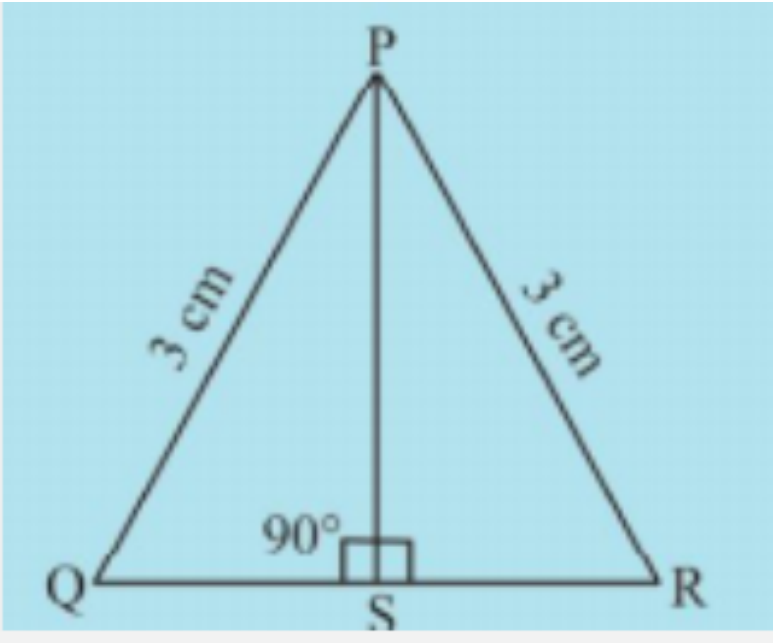

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61. It is to be established by RHS congruence rule that $\triangle ABC \cong \triangle RPQ$. What additional information is needed, if it is given that

$\angle B = \angle P$ and AB = RP?

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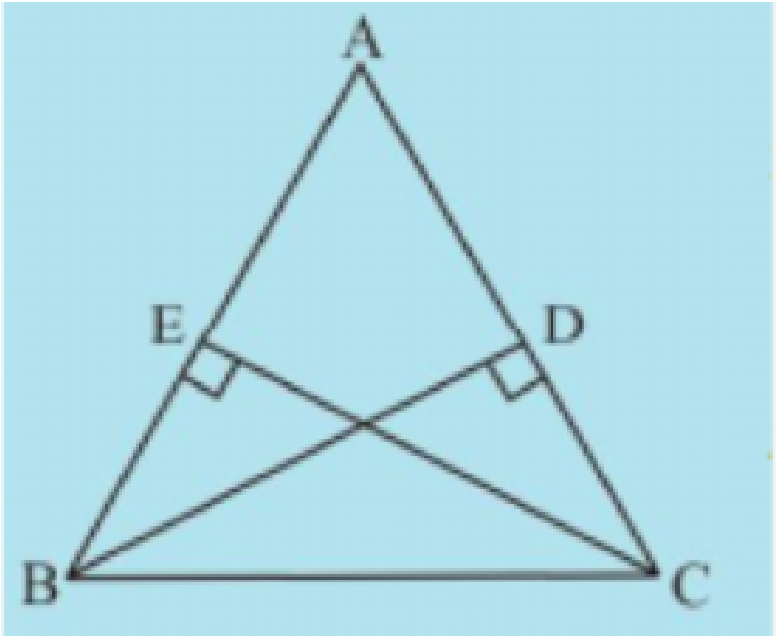
62. In Fig



BD and CE are altitudes of $\triangle ABC$ such that

BD = CE.

State the three pairs in $\triangle CBD$ and

$\triangle BCE$.

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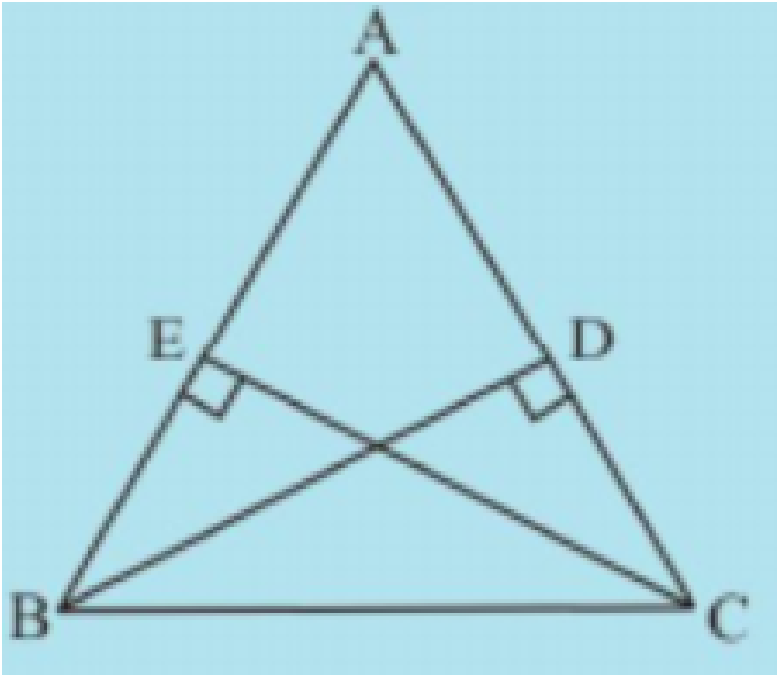
63. In Fig, BD and CE are altitudes of $\triangle ABC$ such that BD = CE.



Is $\triangle CBD \cong \triangle BCE$? Why or why not?

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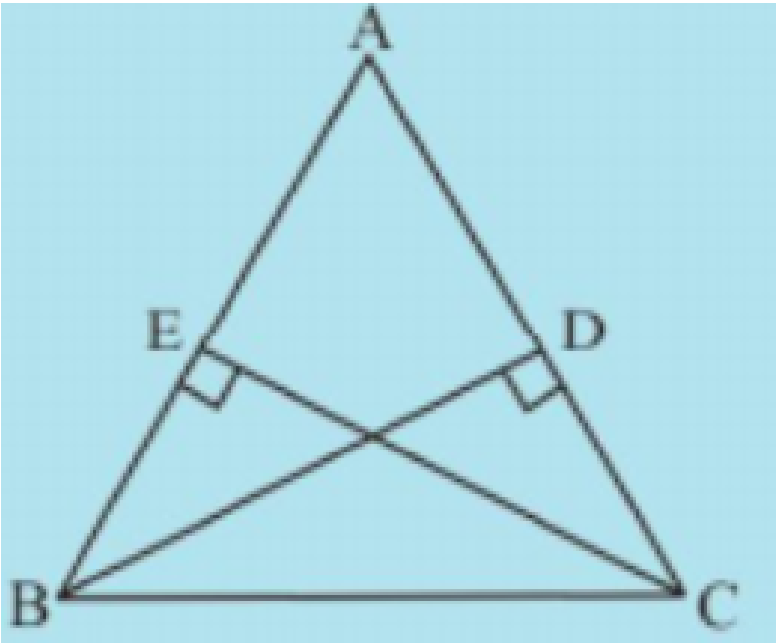
64. In Fig, BD and CE are altitudes of $\triangle ABC$ such that BD = CE.

Is $\angle DCB = \angle EBC$? Why or why not?



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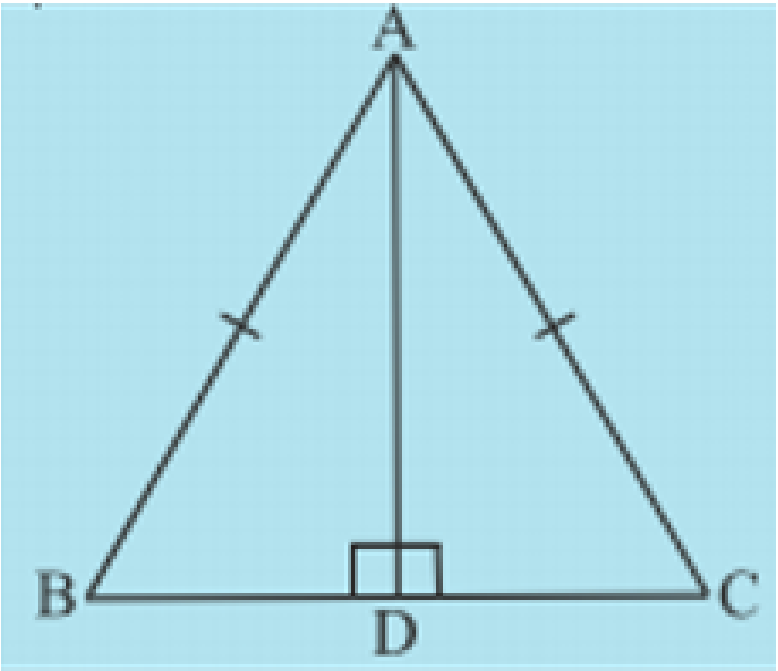
65. ABC is an isosceles triangle with AB = AC and AD is one of its altitudes.



State the three pairs of equal parts in $\triangle ADB$ and $\triangle ADC$.

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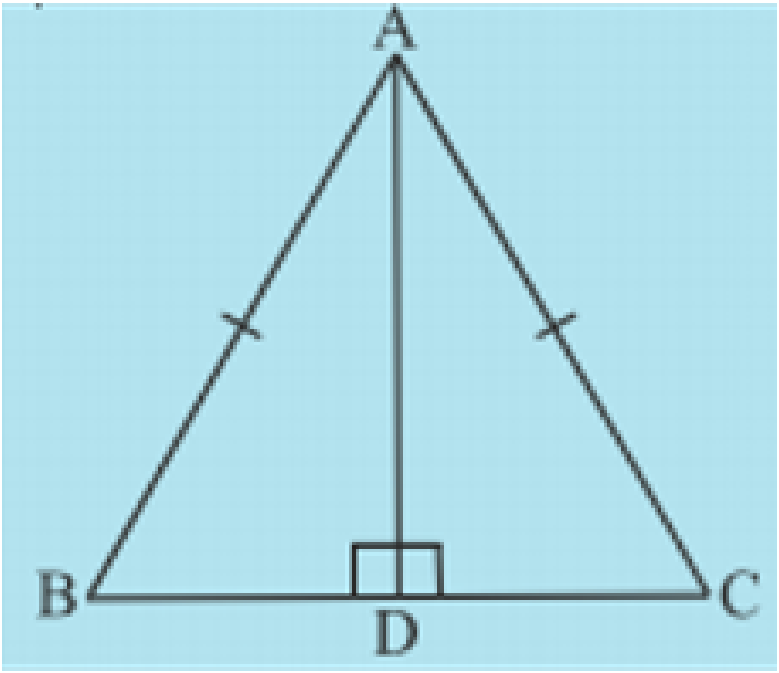

Is $\triangle ADB \cong \triangle ADC$? Why or why not?

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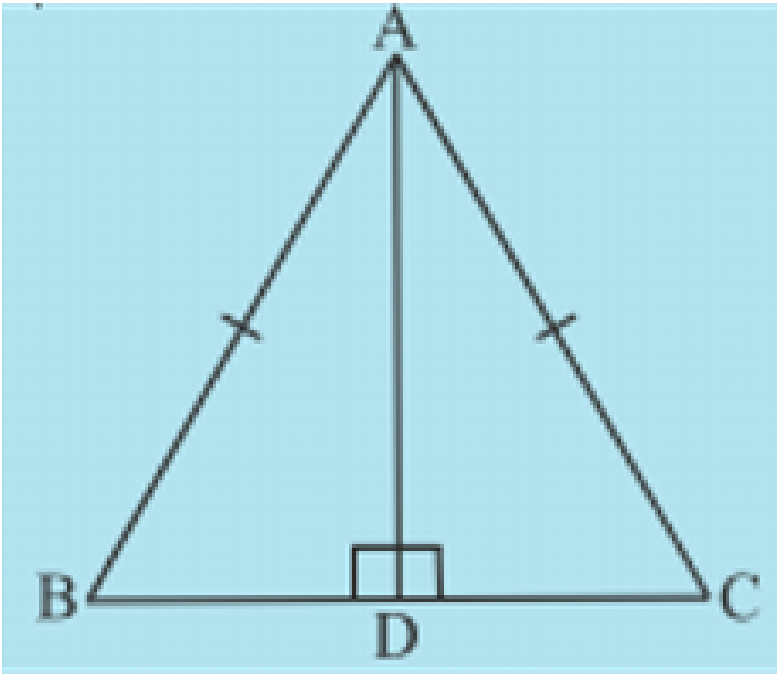
67. ABC is an isosceles triangle with AB = AC and AD is one of its altitudes.



Is $\angle B = \angle C$? Why or why not?

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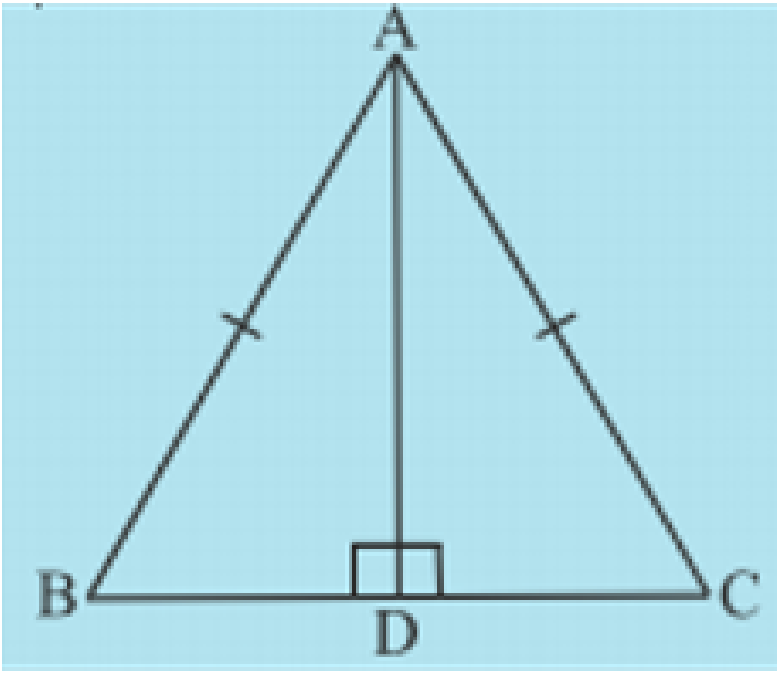
68. ABC is an isosceles triangle with AB = AC and AD is one of its altitudes.



Is BD = CD? Why or why not?

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

Given: Given: AC = DF

AB = DE

BC = EF So, $\triangle ABC \cong \triangle DEF$

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

Given: ZX = RP

RQ = ZY

$\angle PRQ = \angle XZY$

So, $\triangle PQR \cong \triangle XYZ$

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

Given:

$\angle MLN = \angle FGH$

$\angle NML = \angle GFH, ML = FG$

So, $\triangle LMN \cong \triangle GFH$

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

Given: EB = DB

AE = BC

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

So, $\triangle ABE \cong \triangle CDB$

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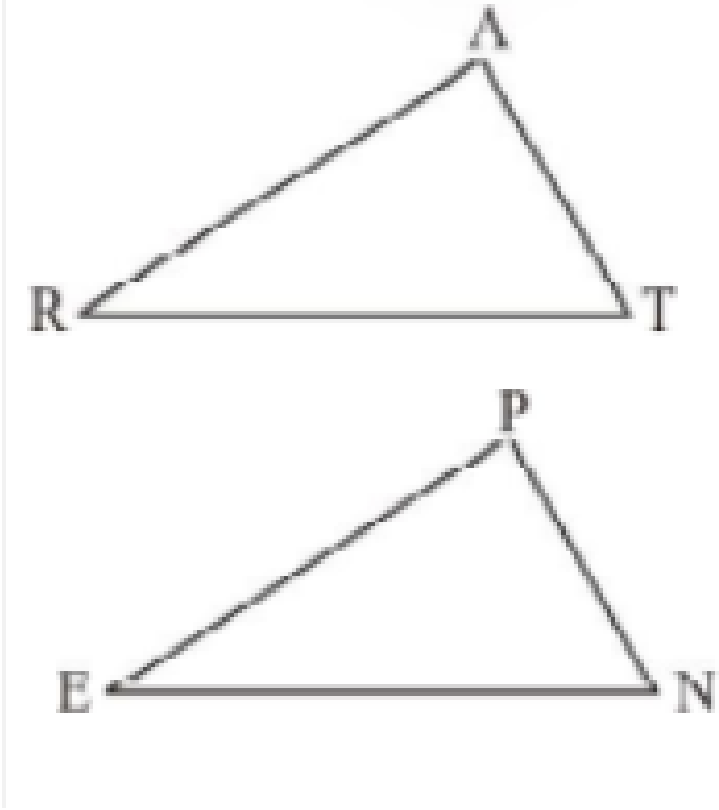
73. You want to show that $\triangle ART \cong \triangle PEN$, (i) AR = (ii) RT= (iii)AT =



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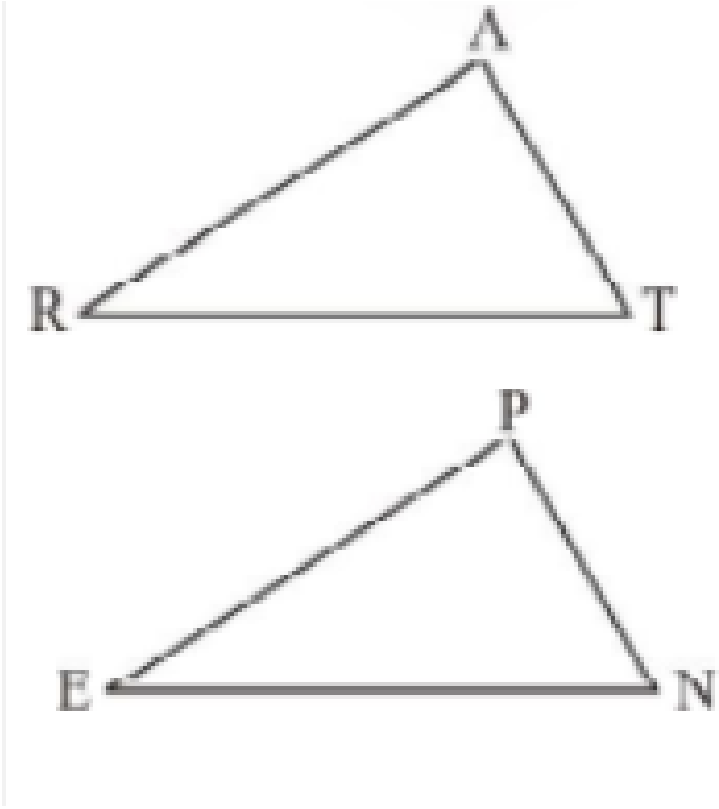
74. You want to show that $\triangle ART \cong \triangle PEN$, If it is given that $\angle T = \angle N$ and you are to use SAS criterion, you need to have (i) RT= and (ii) PN =



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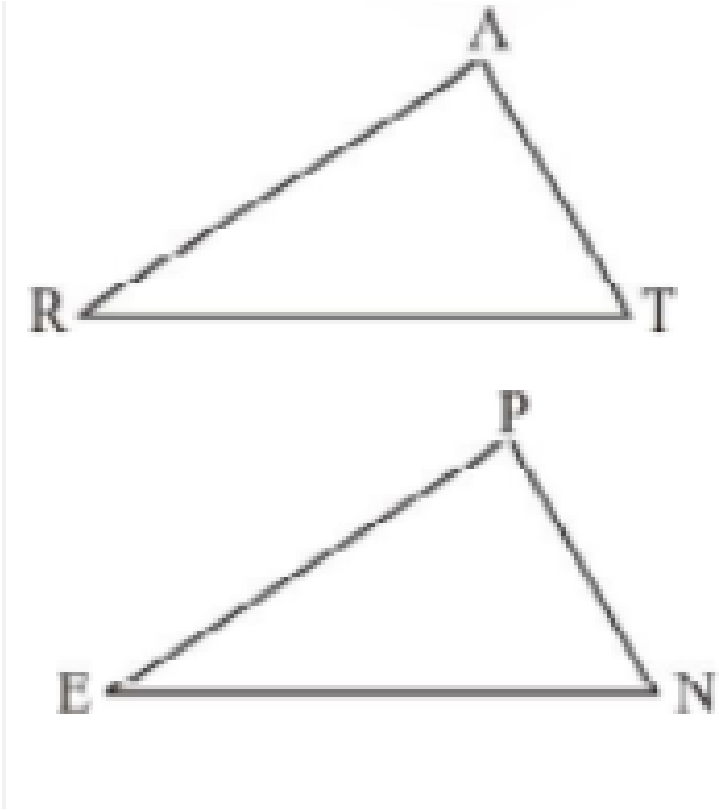
75. You want to show that $\angle ART \cong \angle PEN$,



If you have SSS criterion, (i) AR= (ii)RT= (iii) AT=

?

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76. You have to show that $\triangle AMP \cong \triangle AMQ$.

In the following proof, supply the missing reasons.

Steps		Reasons	
(i)	PM = QM	(i)	...
(ii)	∠PMA = ∠QMA	(ii)	...
(iii)	AM = AM	(iii)	...
(iv)	ΔAMP ≅ ΔAMQ	(iv)	...

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77. In $\triangle ABC, \angle A = 30^\circ, \angle B = 40^\circ$ and $\angle C = 110^\circ$

In $\triangle PQR, \angle P = 30^\circ, \angle Q = 40^\circ$ and $\angle R = 110^\circ$

A student says that $\triangle ABC \cong \triangle PQR$ by AAA congruence criterion. Is he justified? Why or why not?

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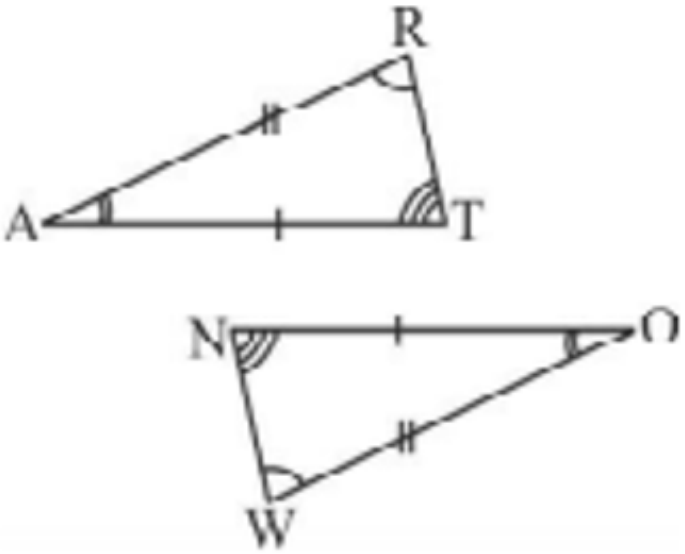
78. In the figure, the two triangles are congruent. The corresponding parts are marked. We can write $\triangle RAT \cong ?$



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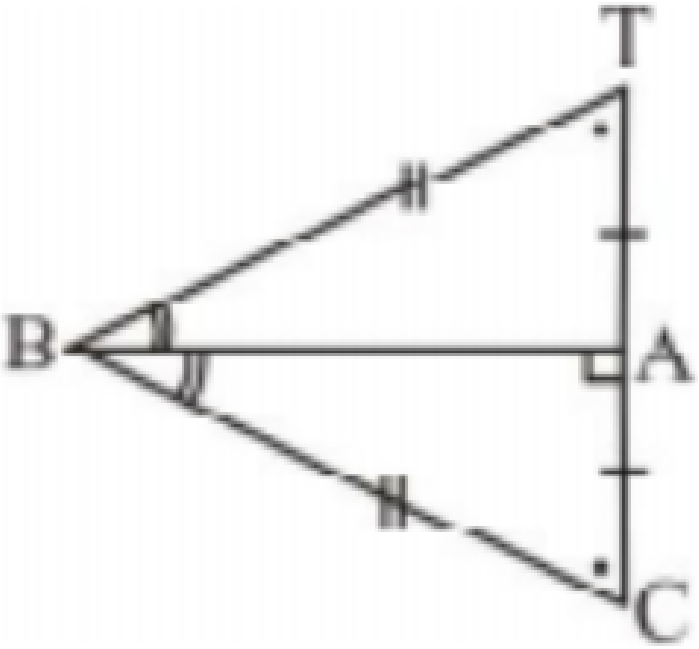
79. Complete the congruence statement:



$\triangle BCA \cong ?$

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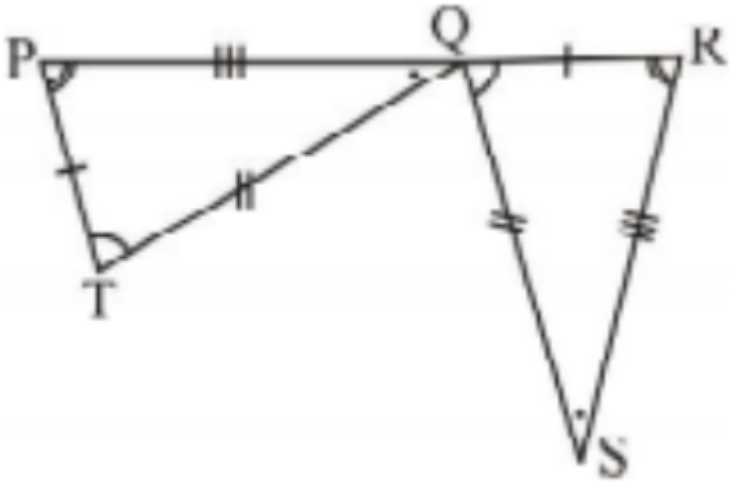
80. Complete the congruence statement:



$\triangle QRS \cong ?$

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81. In a squared sheet, draw two triangles of equal areas such that

the triangles are congruent. What do you say about its perimeters?

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82. In a squared sheet, draw two triangles of equal areas such that

the triangles are not congruent. What do you say about its perimeters?

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83. Draw a rough sketch of two triangles such that they have five pairs of congruent parts but still the triangles are not congruent.

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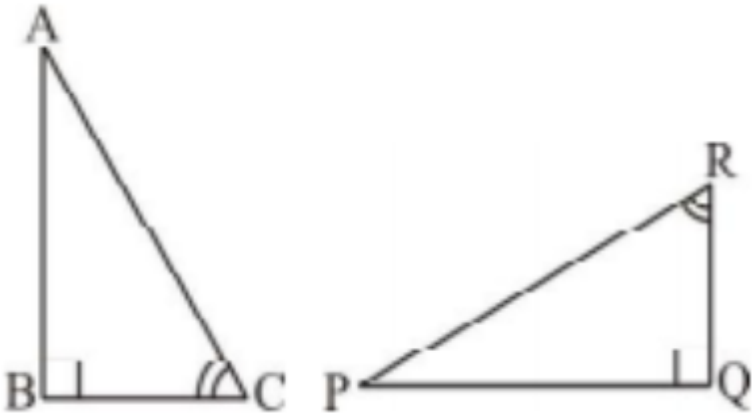
84. If $\triangle ABC$ and $\triangle PQR$ are to be congruent, name one additional pair of corresponding parts. What criterion did you

use?



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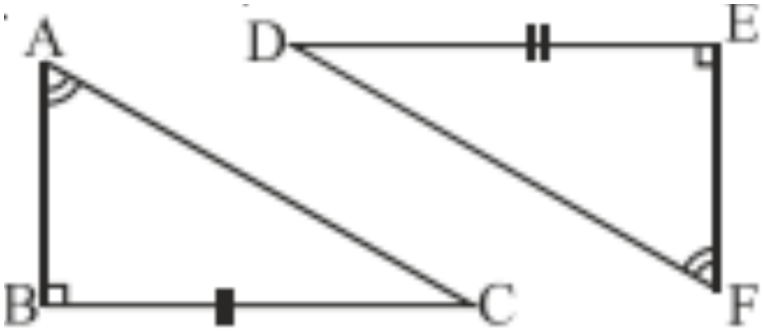
85. Explain, why $\triangle ABC \cong \triangle FED$.



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