

Access answers to Maths NCERT Solutions for Class 7
Chapter 7 – Congruence of Triangles Exercise 7.2

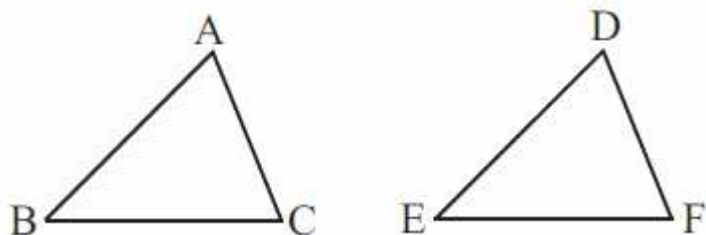
1. Which congruence criterion do you use in the following?

(a) Given: $AC = DF$

$AB = DE$

$BC = EF$

So, $\triangle ABC \cong \triangle DEF$



Solution:-

By SSS congruence property:- Two triangles are congruent if the three sides of one triangle are respectively equal to the three sides of the other triangle.

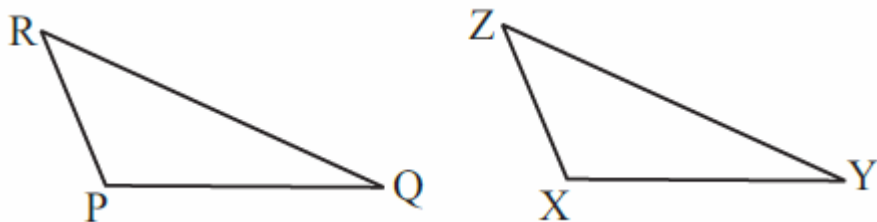
$\triangle ABC \cong \triangle DEF$

(b) Given: $ZX = RP$

$RQ = ZY$

$\angle PRQ = \angle XZY$

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



Solution:-

By SAS congruence property:- Two triangles are congruent if the two sides and the included angle of one are respectively equal to the two sides and the included angle of the other.

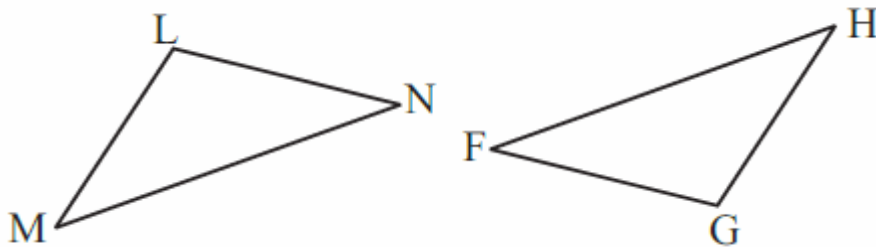
$$\triangle ACB \cong \triangle DEF$$

(c) Given: $\angle MLN = \angle FGH$

$$\angle NML = \angle GFH$$

$$\angle ML = \angle FG$$

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



Solution:-

By ASA congruence property:- Two triangles are congruent if the two angles and the included side of one are respectively equal to the two angles and the included side of the other.

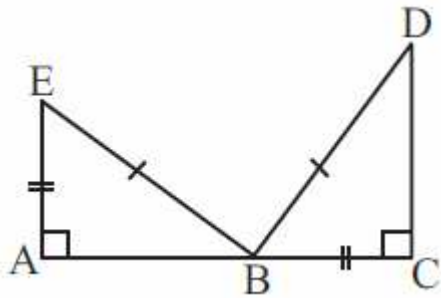
$$\triangle LMN \cong \triangle GFH$$

(d) Given: $EB = DB$

$$AE = BC$$

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

So, $\triangle ABE \cong \triangle ACD$



Solution:-

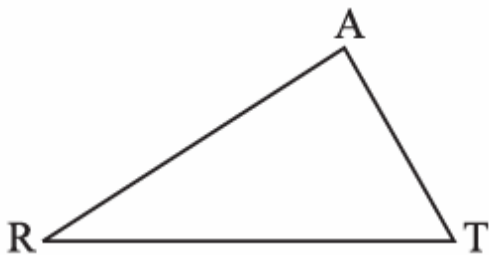
By RHS congruence property:- Two right triangles are congruent if the hypotenuse and one side of the first triangle are respectively equal to the hypotenuse and one side of the second.

$$\triangle ABE \cong \triangle ACD$$

2. You want to show that $\triangle ART \cong \triangle PEN$,

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

(i) $AR =$ (ii) $RT =$ (iii) $AT =$



Solution:-

We know that,

SSS criterion is defined as, two triangles are congruent if the three sides of one triangle are respectively equal to the three sides of the other triangle.

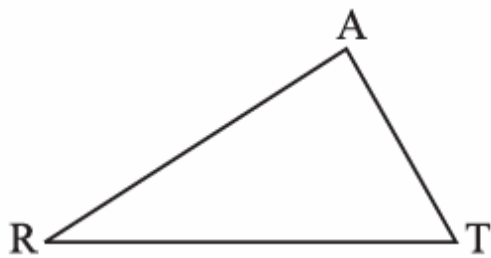
\therefore (i) $AR = PE$

(ii) $RT = EN$

(iii) $AT = PN$

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

(i) $RT =$ and (ii) $PN =$



Solution:-

We know that,

SAS criterion is defined as, two triangles are congruent if the two sides and the included angle of one are respectively equal to the two sides and the included angle of the other.

\therefore (i) $RT = EN$

(ii) $PN = AT$

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

(i) ? (ii) ?

Solution:-

We know that,

ASA criterion is defined as, two triangles are congruent if the two angles and the included side of one are respectively equal to the two angles and the included side of the other.

Then,

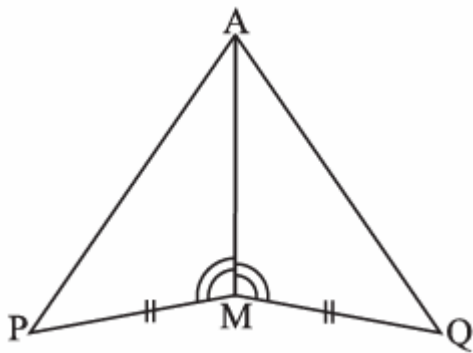
(i) $\angle ATR = \angle PNE$

(ii) $\angle RAT = \angle EPN$

3. 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) $\angle PMA = \angle QMA$	(ii) ...
(iii) $AM = AM$	(iii) ...
(iv) $\triangle AMP \cong \triangle AMQ$	(iv) ...



Solution:-

Steps	Reasons
(i) $PM = QM$	(i) From the given figure
(ii) $\angle PMA$ $= \angle QMA$	(ii) From the given figure
(iii) $AM = AM$	(iii) Common side for the both triangles

(iv) $\triangle AMP$ $\cong \triangle AMQ$	(iv) By SAS congruence property:- Two triangles are congruent if the two sides and the included angle of one are respectively equal to the two sides and the included angle of the other.
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4. 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

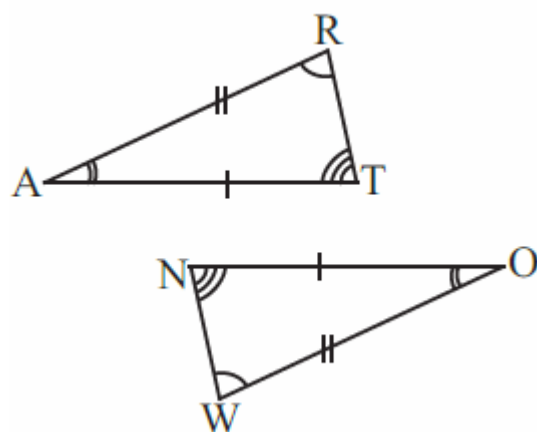
or Why not?

Solution:-

No, because the two triangles with equal corresponding angles need not be congruent. In such a correspondence, one of them can be enlarged copy of the other.

5. In the figure, the two triangles are congruent. The corresponding parts are marked.

We can write $\triangle RAT \cong ?$



Solution:-

From the given figure,

We may observe that,

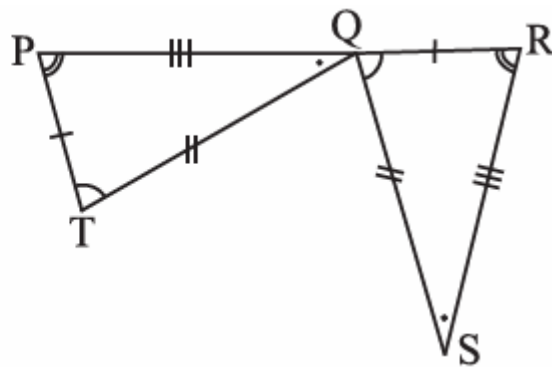
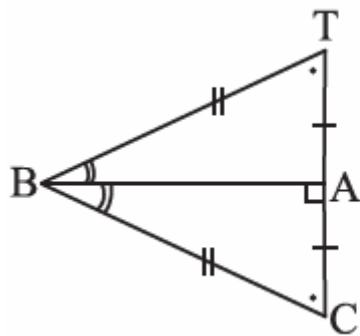
$$\angle TRA = \angle OWN$$

$$\angle TAR = \angle NOW$$

$$\angle ATR = \angle ONW$$

Hence, $\Delta RAT \cong \Delta WON$

6. Complete the congruence statement:



$$\Delta BCA \cong \Delta QRS \cong$$

Solution:-

First consider the ΔBCA and ΔBTA

From the figure, it is given that,

$$BT = BC$$

Then,

BA is common side for the ΔBCA and ΔBTA

Hence, $\Delta BCA \cong \Delta BTA$

Similarly,

Consider the ΔQRS and ΔTPQ

From the figure, it is given that

$$PT = QR$$

$$TQ = QS$$

$$PQ = RS$$

Hence, $\triangle QRS \cong \triangle TPQ$

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

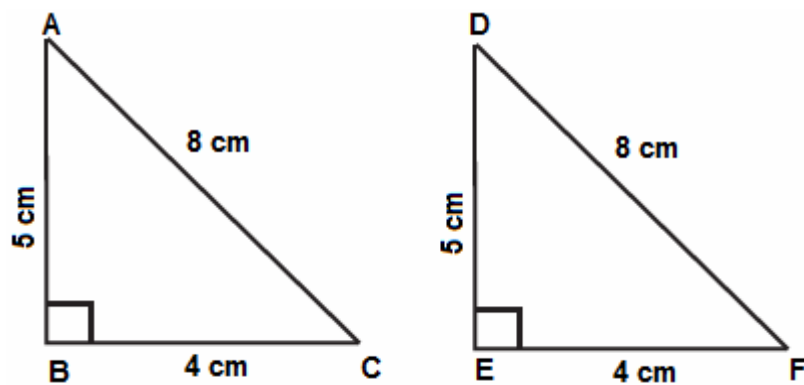
(i) The triangles are congruent.

(ii) The triangles are not congruent.

What can you say about their perimeters?

Solution:-

(ii)

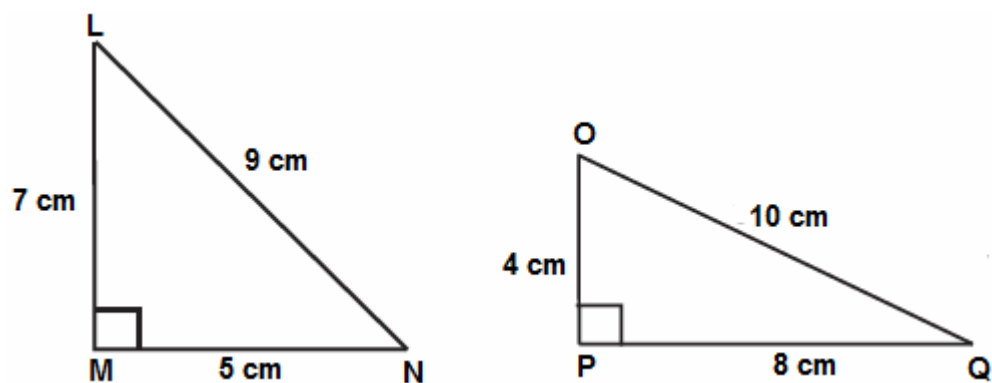


In the above figure, $\triangle ABC$ and $\triangle DEF$ have equal areas.

And also, $\triangle ABC \cong \triangle DEF$

So, we can say that perimeters of $\triangle ABC$ and $\triangle DEF$ are equal.

(ii)



In the above figure, $\triangle LMN$ and $\triangle OPQ$

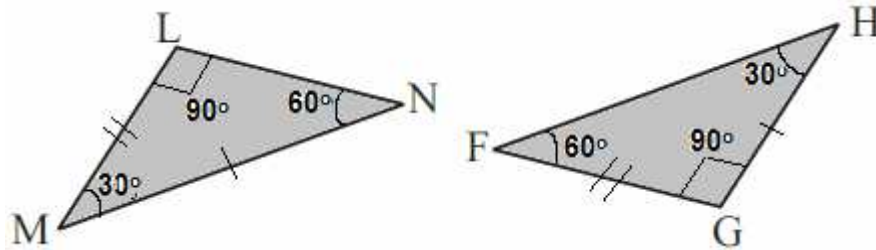
$\triangle LMN$ is not congruent to $\triangle OPQ$

So, we can also say that their perimeters are not same.

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

Solution:-

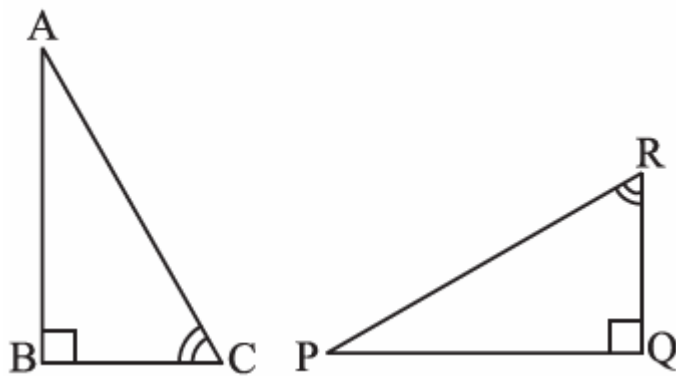
Let us draw triangles LMN and FGH.



In the above figure, all angles of two triangles are equal. But, out of three sides only two sides are equal.

Hence, $\triangle LMN$ is not congruent to $\triangle FGH$.

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



Solution:-

By observing the given figure, we can say that

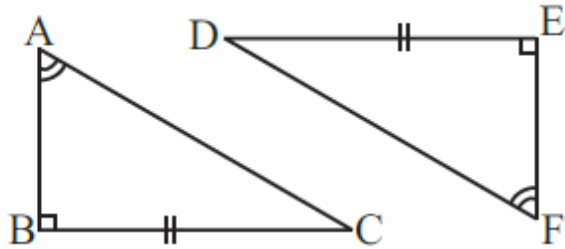
$$\angle ABC = \angle PQR$$

$$\angle BCA = \angle PRQ$$

The other additional pair of corresponding part is $BC = QR$

$$\therefore \triangle ABC \cong \triangle PQR$$

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



Solution:-

From the figure, it is given that,

$$\angle ABC = \angle FED = 90^\circ$$

$$\angle BAC = \angle DFE$$

$$BC = DE$$

By ASA congruence property, two triangles are congruent if the two angles and the included side of one are respectively equal to the two angles and the included side of the other.

$$\triangle ABC \cong \triangle FED$$

EVER