NCERT Solutions for Class 7 Maths Chapter 7

Congruence of Triangles Class 7

Chapter 7 Congruence of Triangles Exercise 7.1, 7.2 Solutions

Exercise 7.1 : Solutions of Questions on Page Number : **137**

Q1 :

Complete the following statements:

(a) Two line segments are congruent if _____.

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

(c) When we write ∠ A = ∠ B, we actually mean _____.

Answer :

(a) They have the same length

(b) 70°

(c) m ∠ A = m ∠ B

Q2 :

Give any two real-life examples for congruent shapes.

Answer :

(i) Sheets of same letter pad
(ii) Biscuits in the same packet

Q3 :

If ΔABC ≅ ΔFED under the correspondence ABC Ã¢â€ â€ FED, write all the Corresponding congruent parts of the triangles.

Answer :

If these triangles are congruent, then the corresponding angles and sides will be equal to each other.

∠A ↔ ∠F

∠B ↔ ∠E

∠C ↔ ∠D

$\overline{AB} \leftrightarrow \overline{FE}$

$\overline{BC} \leftrightarrow \overline{ED}$

$\overline{CA} \leftrightarrow \overline{DF}$

Q4 :

If ΔDEF ≅ ΔBCA, write the part(s) of ΔBCA that correspond to

(i) ∠E (ii) $\overline{EF}$ (iii) ∠F (iv) $\overline{DF}$

Answer :

(i) ∠C

$\overline{CA}$ (ii)

(iii) ∠A

$\overline{BA}$ (iv)

Exercise 7.2 : Solutions of Questions on Page Number : **149**

Q1 :

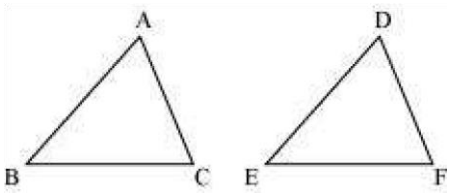
Which congruence criterion do you use in the following?

(a) Given: AC = DF

AB = DE

BC = EF

So, ΔABC ≅ ΔDEF

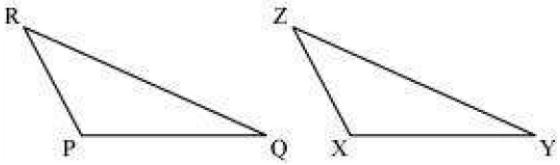


(b) Given: ZX = RP

RQ = ZY

∠ PRQ = ∠ XZY

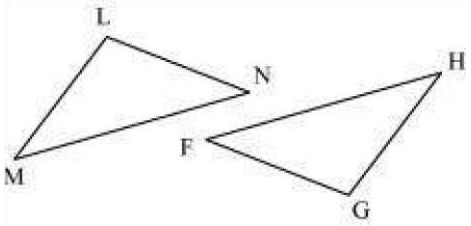
So, ΔPQR ≅ ΔXYZ



(c) Given:∠ MLN = ∠ FGH ∠ NML = ∠ GFH

ML = FG

So, ΔLMN ≅ ΔGFH

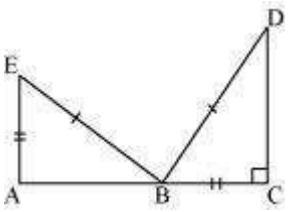


(d) Given: EB = DB AE

= BC

∠ A = ∠ C = 90°

So, ΔABE ≅ ΔCDB



Answer :

(a) SSS, as the sides of ΔABC are equal to the sides of ΔDEF.

(b) SAS, as two sides and the angle included between these sides of ΔPQR are equal to two sides and the angle included between these sides of ΔXYZ.

(c) ASA, as two angles and the side included between these angles of ΔLMN are equal to two angles and the side included between these angles of ΔGFH.

(d) RHS, as in the given two right-angled triangles, one side and the hypotenuse are respectively equal.

Q2 :

You want to show that ΔART ≅ ΔPEN,

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

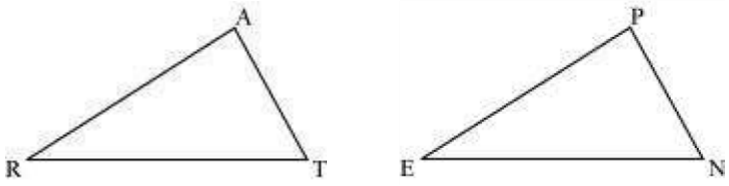
(i) AR = (ii) RT = (iii) AT =

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

(i) RT = and (ii) PN =

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

(i) ? (ii) ?



Answer :

(a)
(i) AR = PE

(ii) RT = EN

(iii) AT = PN

(b)

(i) RT = EN

(ii) PN = AT

(c)

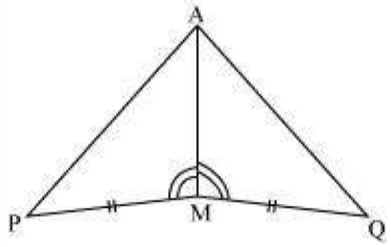
(i) ∠ ATR = ∠ PNE (ii)
∠ RAT = ∠ EPN

Q3 :

You have to show that ΔAMP ≅ 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)	…



Answer :

(i) Given

(ii) Given

(iii) Common

(iv) SAS, as the two sides and the angle included between these sides of ΔAMP are equal to two sides and the angle included between these sides of ΔAMQ.

Q4 :

In ΔABC, ∠ A = 30°, ∠ B = 40° and ∠ C = 110°

In ΔPQR, ∠ P = 30°, ∠ Q = 40° and ∠ R = 110°

A student says that ΔABC ≅ ΔPQR by AAA congruence criterion. Is he justified? Why or why not?

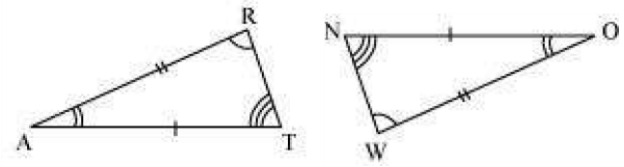
Answer :

No. This property represents that these triangles have their respective angles of equal measure. However, this gives no information about their sides. The sides of these triangles have a ratio somewhat different than 1:1. Therefore, AAA property does not prove the two triangles congruent.

Q5 :

In the figure, the two triangles are congruent.

The corresponding parts are marked. We can write ΔRAT ?



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Answer :

It can be observed that,

∠RAT = ∠WON

∠ART = ∠OWN

AR = OW

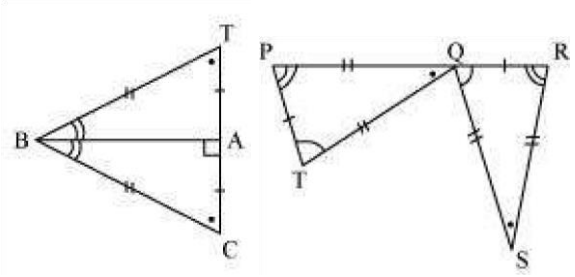
Therefore, ΔRAT ≅ ΔWON, by ASA criterion.

Q6 :

Complete the congruence statement:

ΔBCA ≅?

ΔQRS ?



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Answer :

Given that, BC = BT

TA = CA

BA is common.

Therefore, ΔBCA ≅ ΔBTA

Similarly, PQ = RS
TQ = QS PT
= RQ

Therefore, ΔQRS ≅ ΔTPQ

Q7 :

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

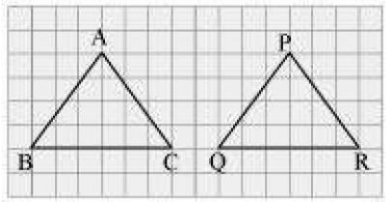
(i) The triangles are congruent.

(ii) The triangles are not congruent.

What can you say about their perimeters?

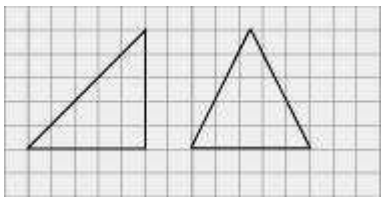
Answer :

(i)



Here, ΔABC and ΔPQR have the same area and are congruent to each other also. Also, the perimeter of both the triangles will be the same.

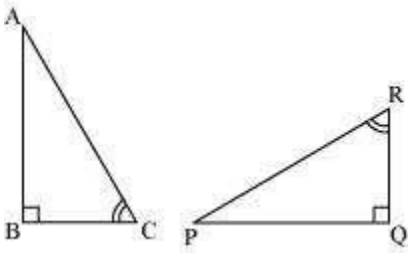
(ii)



Here, the two triangles have the same height and base. Thus, their areas are equal. However, these triangles are not congruent to each other. Also, the perimeter of both the triangles will not be the same.

Q8 :

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



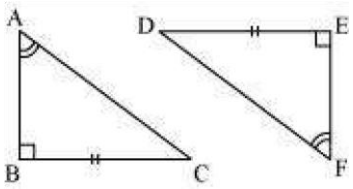
Answer :

BC = QR

ΔABC ≅ ΔPQR (ASA criterion)

Q9 :
Explain, why

ΔABC ≅ ΔFED



Answer :

Given that, ∠ ABC = ∠ FED (1) ∠

BAC = ∠ EFD (2)

The two angles of ΔABC are equal to the two respective angles of ΔFED. Also, the sum of all interior angles of a triangle is 180º.

Therefore, third angle of both triangles will also be equal in measure. ∠ BCA = ∠ EDF (3)

Also, given that, BC = ED (4)

By using equation (1), (3), and (4), we obtain

ΔABC ≅ ΔFED (ASA criterion)