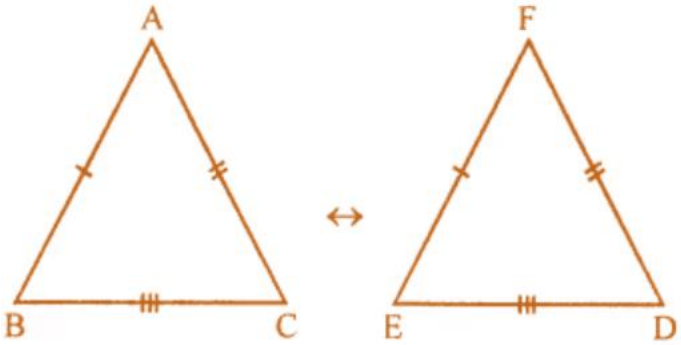
Exercise

1. If ΔABC and ΔDEF are congruent under the correspondence ABC ↔ FED, write all the corresponding congruent parts of the triangles.
Solution:

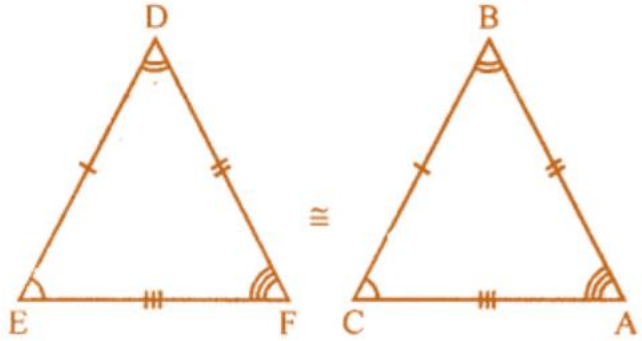
Given, ΔABC and ΔDEF are congruent under the correspondence,
ABC ↔ FED



Hence,
∠A ↔ ∠F, ∠B ↔ ∠E, ∠C ↔ ∠D
AB ↔ FE, BC ↔ ED and AC ↔ FD

2. If ΔDEF = ΔBCA, then write the part(s) of ΔBCA that correspond to
(i) ∠E
(ii) EF
(iii) ∠F
(iv) DF
Solution:

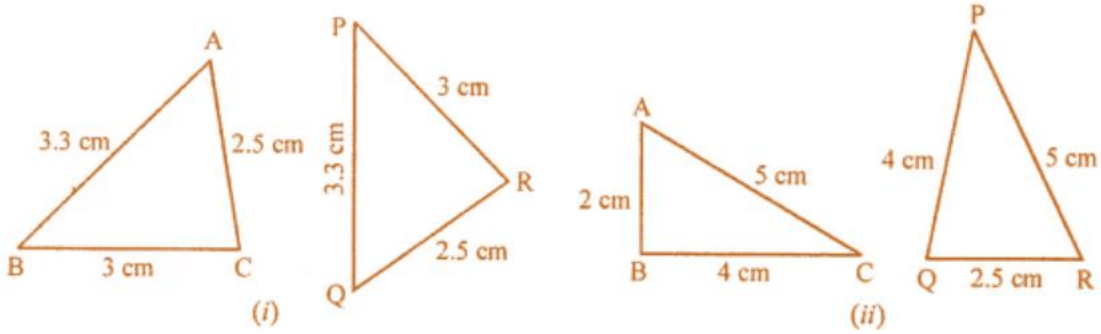
If ΔDEF = ΔBCA, then



(i) ∠E ↔ ∠C
(ii) EF ↔ CA
(iii) ∠F ↔ ∠A
(iv) DF ↔ BA

3. In the figure given below, the lengths of the sides of the triangles are indicated. By using SSS congruency rule, state which pairs of triangles are congruent. In the case of congruent triangles,

write the result in symbolic form:

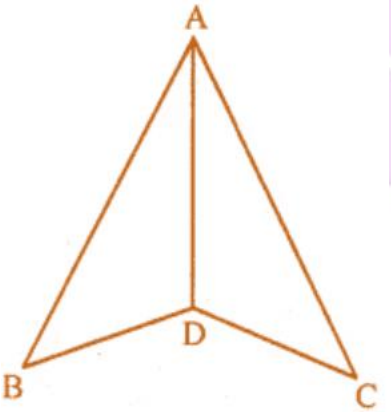


Solution:

(i) In the given figure,
In ΔABC and ΔPQR, it's seen that
AB ↔ PQ, BC ↔ PR, and AC ↔ QR
So, Δs are congruent
Hence, ΔABC ≅ ΔQPR

(ii) In the given figure,
In ΔABC and ΔPQR
AC ↔ PR, BC ↔ PQ
But, AB ≠ QR
Hence, Δs are not congruent.

4. In the given figure, AB = 5 cm, AC = 5 cm, BD = 2.5 cm and CD = 2.5 cm
(i) State the three pairs of equal parts in ΔADB and ΔADC
(ii) Is ΔADB = ΔADC? Give reasons.
(iii) Is ∠B = ∠C? Why?

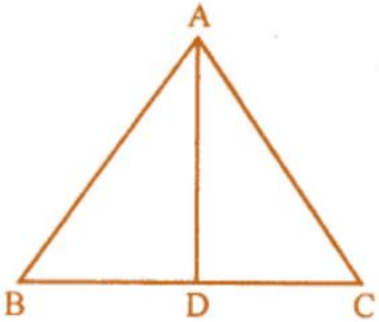


Solution:

In the given figure, we have
AB = 5 cm, AC = 5 cm, BD = 2.5 cm and CD = 2.5 cm
In ΔABD and ΔACD,
(i) AB = AC = 5 cm

BD = CD = 2.5 cm
AD = AD (Common Side)
(ii) Hence, ΔABD ≅ ΔACD (By SSS axiom)
(iii)As ΔABD ≅ ΔACD, by C.P.C.T
we have, ∠B = ∠C

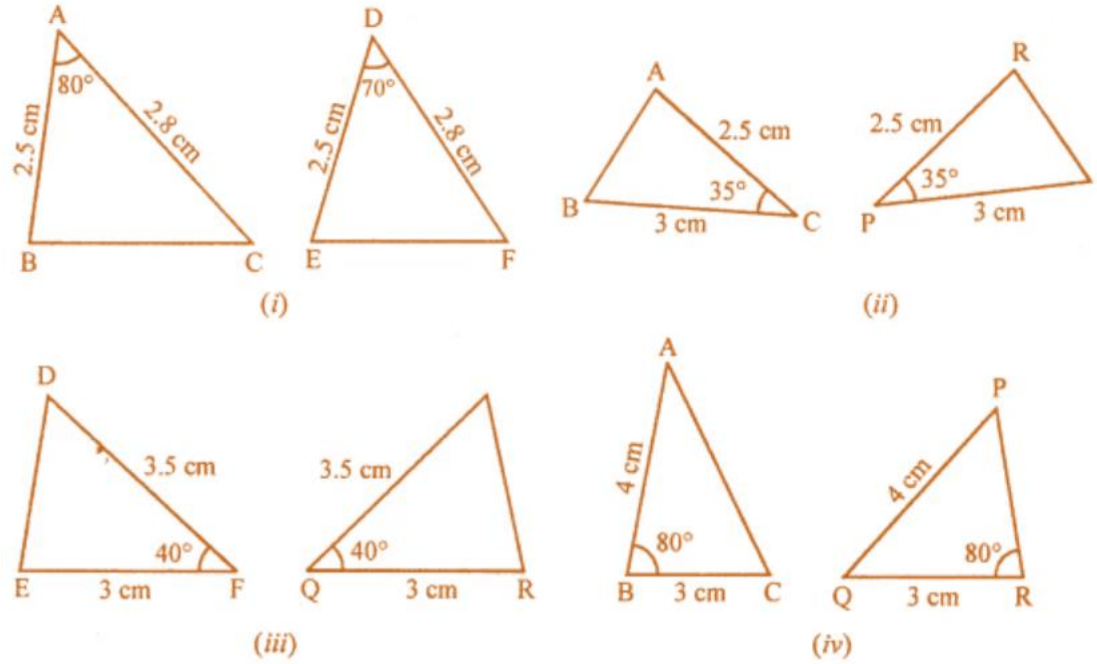
5. In the given figure, AB = AC and D is the mid-point of BC.
(i) State the three pairs of equal parts in ΔADB and ΔADC.
(ii) Is ΔADB = ΔADC? Give reasons.
(iii) Is ∠B = ∠C? Why?



Solution:

(i) In ΔABC, we have
AB = AC
And, D is the mid-point of BC
BD = DC
Now, in ΔADB and ΔADC
AB = AC (Given)
AD = AD (Common)
BD = DC (D is mid-point of BC)
(ii) ΔADB ≅ ΔADC by SSS axiom
(iii) By c.p.c.t.,
∠B = ∠C

6. In the figure given below, the measures of some parts of the triangles are indicated. By using SAS rule of congruency, state which pairs of triangles are congruent. In the case of congruent triangles, write the result in symbolic form.



Solution:

(i) In ΔABC and ΔDEF, we have
AB = DE (Each = 2.5 cm)
AC = DF (Each = 2.8 cm)
But, ∠A ≠ ∠D (Have different measure)
Hence, ΔABC is not congruent to ΔDEF.

(ii) In ΔABC and ΔRPQ, we have
AC = RP (Each = 2.5 cm)
CB = PQ (Each = 3 cm)
∠C = ∠P (Each = 35°)
Hence, ΔACB and ΔRPQ are congruent by SAS axiom of congruency.

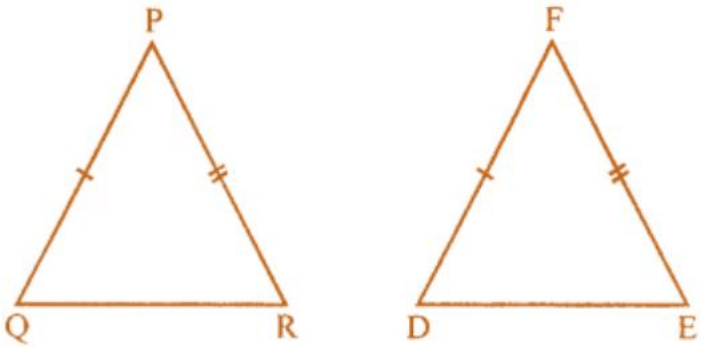
(iii) In ΔDEF and ΔPQR, we have
FD = QP (Each = 3.5 cm)
FE = QR (Each = 3 cm)
∠F = ∠Q (Each 40°)
Hence, ΔDEF and ΔPQR are congruent by SAS axiom of congruency.

(iv) In ΔABC and ΔPRQ, we have
AB = PQ (Each = 4 cm)
BC = QR (Each = 3 cm)
But, included angles B and ∠Q are not equal
Hence, ΔABC and ΔPQR are not congruent to each other.

7. By applying SAS congruence rule, you want to establish that ΔPQR = ΔFED. If is given that PQ = EF and RP = DF. What additional information is needed to establish the congruence?

Solution:

In ΔPQR and ΔFED, we have



PQ = FE
RP = DF
Now, their included angles ∠P must be equal to ∠F for congruency.
Thus, ∠P = ∠F.