

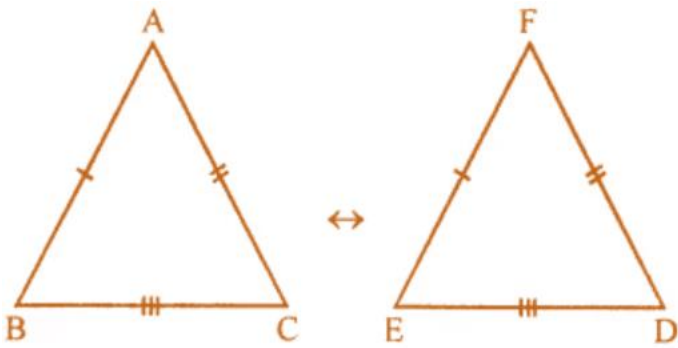
ML Aggarwal Solutions for Class 7 Maths  
Chapter 12: Congruence of Triangles

Exercise

1. If  $\triangle ABC$  and  $\triangle DEF$  are congruent under the correspondence  $ABC \leftrightarrow FED$ , write all the corresponding congruent parts of the triangles.

Solution:

Given,  $\triangle ABC$  and  $\triangle DEF$  are congruent under the correspondence,  
 $ABC \leftrightarrow FED$



Hence,

$\angle A \leftrightarrow \angle F$ ,  $\angle B \leftrightarrow \angle E$ ,  $\angle C \leftrightarrow \angle D$

$AB \leftrightarrow FE$ ,  $BC \leftrightarrow ED$  and  $AC \leftrightarrow FD$

2. If  $\triangle DEF = \triangle BCA$ , then write the part(s) of  $\triangle BCA$  that correspond to

(i)  $\angle E$

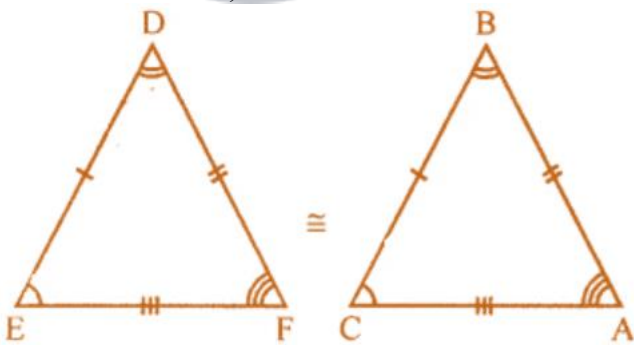
(ii)  $EF$

(iii)  $\angle F$

(iv)  $DF$

Solution:

If  $\triangle DEF = \triangle BCA$ , then



(i)  $\angle E \leftrightarrow \angle C$

(ii)  $EF \leftrightarrow CA$

(iii)  $\angle F \leftrightarrow \angle A$

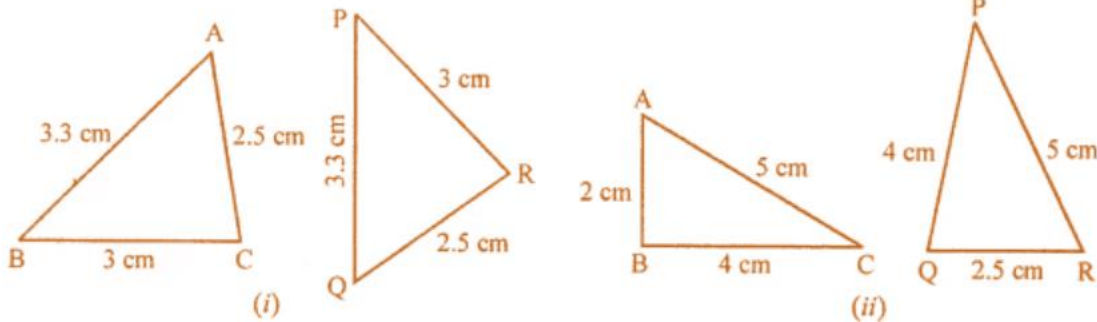
(iv)  $DF \leftrightarrow BA$

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,

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## Chapter 12: Congruence of Triangles

write the result in symbolic form:



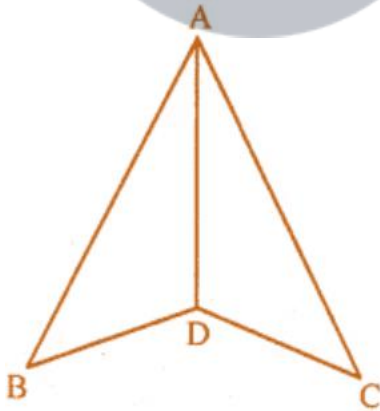
**Solution:**

(i) In the given figure,  
In  $\triangle ABC$  and  $\triangle PQR$ , it's seen that  
 $AB \leftrightarrow PQ$ ,  $BC \leftrightarrow PR$ , and  $AC \leftrightarrow QR$   
So,  $\triangle s$  are congruent  
Hence,  $\triangle ABC \cong \triangle PQR$

(ii) In the given figure,  
In  $\triangle ABC$  and  $\triangle PQR$   
 $AC \leftrightarrow PR$ ,  $BC \leftrightarrow PQ$   
But,  $AB \neq QR$   
Hence,  $\triangle s$  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  $\triangle ADB$  and  $\triangle ADC$   
(ii) Is  $\triangle ADB = \triangle ADC$ ? Give reasons.  
(iii) Is  $\angle B = \angle C$ ? Why?



**Solution:**

In the given figure, we have  
 $AB = 5$  cm,  $AC = 5$  cm,  $BD = 2.5$  cm and  $CD = 2.5$  cm  
In  $\triangle ABD$  and  $\triangle ACD$ ,  
(i)  $AB = AC = 5$  cm

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$$BD = CD = 2.5 \text{ cm}$$

$$AD = AD \text{ (Common Side)}$$

(ii) Hence,  $\triangle ABD \cong \triangle ACD$  (By SSS axiom)

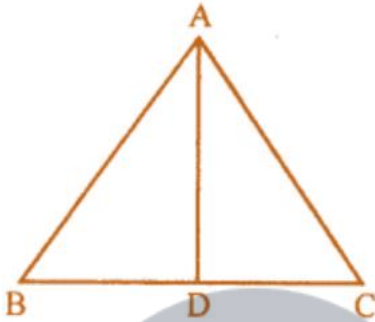
(iii) As  $\triangle ABD \cong \triangle ACD$ , by C.P.C.T  
we have,  $\angle B = \angle C$

**5. In the given figure,  $AB = AC$  and  $D$  is the mid-point of  $BC$ .**

**(i) State the three pairs of equal parts in  $\triangle ADB$  and  $\triangle ADC$ .**

**(ii) Is  $\triangle ADB = \triangle ADC$ ? Give reasons.**

**(iii) Is  $\angle B = \angle C$ ? Why?**



**Solution:**

(i) In  $\triangle ABC$ , we have

$$AB = AC$$

And,  $D$  is the mid-point of  $BC$

$$BD = DC$$

Now, in  $\triangle ADB$  and  $\triangle ADC$

$$AB = AC \text{ (Given)}$$

$$AD = AD \text{ (Common)}$$

$$BD = DC \text{ (D is mid-point of BC)}$$

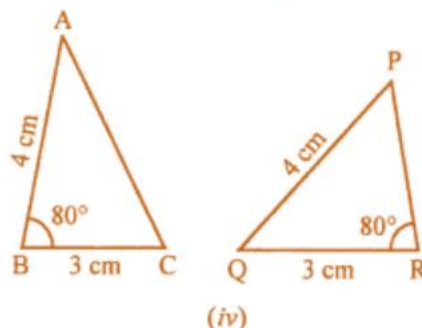
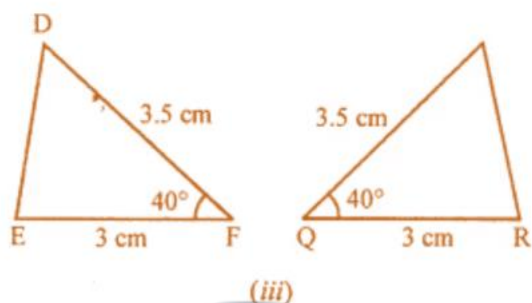
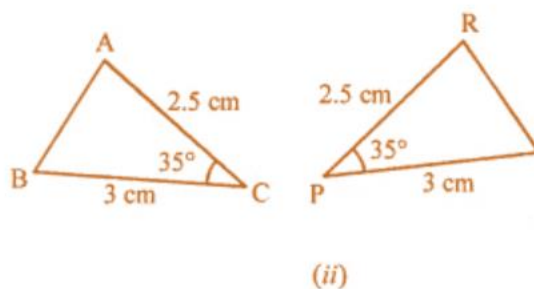
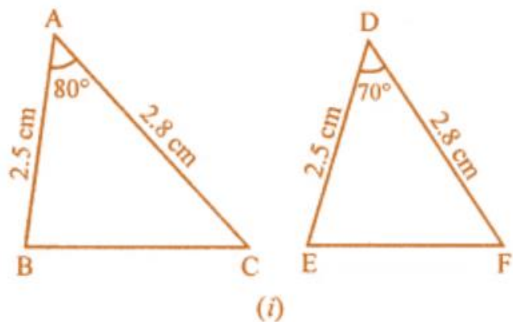
(ii)  $\triangle ADB \cong \triangle ADC$  by SSS axiom

(iii) By c.p.c.t.,

$$\angle B = \angle C$$

**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.**

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### Solution:

(i) In  $\triangle ABC$  and  $\triangle DEF$ , we have  
 $AB = DE$  (Each = 2.5 cm)  
 $AC = DF$  (Each = 2.8 cm)  
 But,  $\angle A \neq \angle D$  (Have different measure)  
 Hence,  $\triangle ABC$  is not congruent to  $\triangle DEF$ .

(ii) In  $\triangle ABC$  and  $\triangle RPQ$ , we have  
 $AC = RP$  (Each = 2.5 cm)  
 $CB = PQ$  (Each = 3 cm)  
 $\angle C = \angle P$  (Each =  $35^\circ$ )  
 Hence,  $\triangle ACB$  and  $\triangle RPQ$  are congruent by SAS axiom of congruency.

(iii) In  $\triangle DEF$  and  $\triangle PQR$ , we have  
 $FD = QP$  (Each = 3.5 cm)  
 $FE = QR$  (Each = 3 cm)  
 $\angle F = \angle Q$  (Each  $40^\circ$ )  
 Hence,  $\triangle DEF$  and  $\triangle PQR$  are congruent by SAS axiom of congruency.

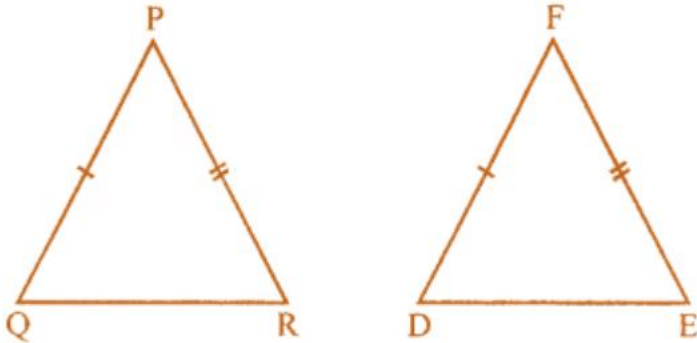
(iv) In  $\triangle ABC$  and  $\triangle PQR$ , we have  
 $AB = PQ$  (Each = 4 cm)  
 $BC = QR$  (Each = 3 cm)  
 But, included angles  $B$  and  $\angle Q$  are not equal  
 Hence,  $\triangle ABC$  and  $\triangle PQR$  are not congruent to each other.

**7. By applying SAS congruence rule, you want to establish that  $\triangle PQR = \triangle FED$ . If is given that  $PQ = EF$  and  $RP = DF$ . What additional information is needed to establish the congruence?**

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**Solution:**

In  $\triangle PQR$  and  $\triangle FED$ , we have



$$PQ = FE$$

$$RP = DF$$

Now, their included angles  $\angle P$  must be equal to  $\angle F$  for congruency.

Thus,  $\angle P = \angle F$ .



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