RD SHARMA

Solutions

Class 7 Maths

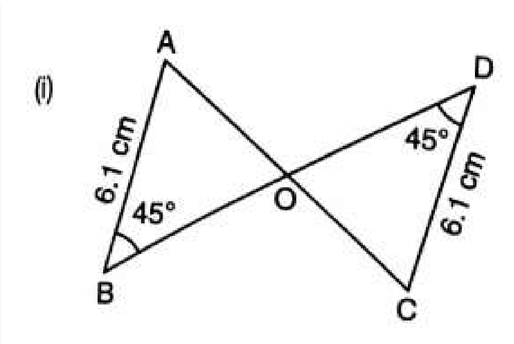
Chapter 16

Ex 16.4

Q1. Which of the following pairs of triangle are congruent by ASA condition?

Answer:

i)



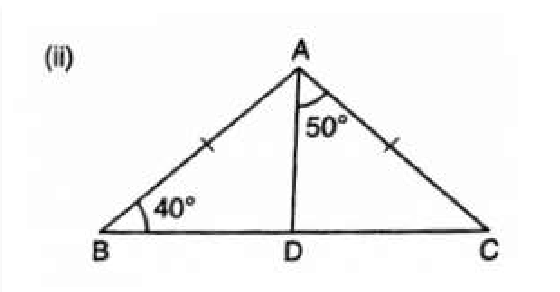
We have,

Since ∠ ABO = ∠ CDO = 45° and both are alternate angles, AB // DC, ∠BAO = ∠ DCO (alternate angle, AB // CD and AC is a transversal line)

∠ ABO = ∠ CDO = 45° (given in the figure) Also, AB = DC (Given in the figure)

Therefore, by ASA $\Delta AOB \cong \Delta DOC$

ii)



In ABC ,

Now AB =AC (Given)

∠ ABD = ∠ ACD = 40° (Angles opposite to equal sides)

∠ ABD + ∠ ACD + ∠ BAC = 180° (Angle sum property)

40° + 40° + ∠ BAC=180°

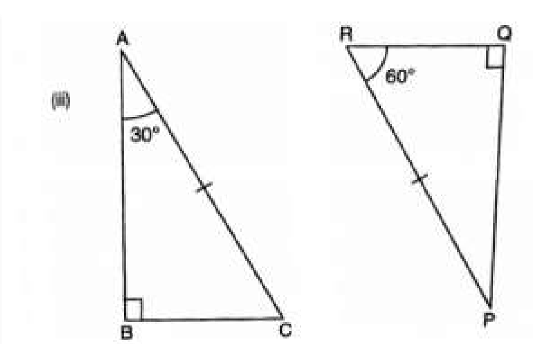
∠ BAC =180°- 80° =100°

∠ BAD + ∠ DAC = ∠ BAC ∠ BAD = ∠ BAC – ∠ DAC = 100° – 50° = 50°

∠ BAD = ∠ CAD = 50°

Therefore, by ASA, $\Delta ABD \cong \Delta ADC$

iii)



In Δ ABC,

$\angle$ A + $\angle$ B + $\angle$ C = 180°(Angle sum property)

$\angle$ C = 180°- $\angle$ A – $\angle$ B $\angle$ C = 180° – 30° – 90° = 60°

In PQR,

$\angle$ P + $\angle$ Q + $\angle$ R = 180°(Angle sum property)

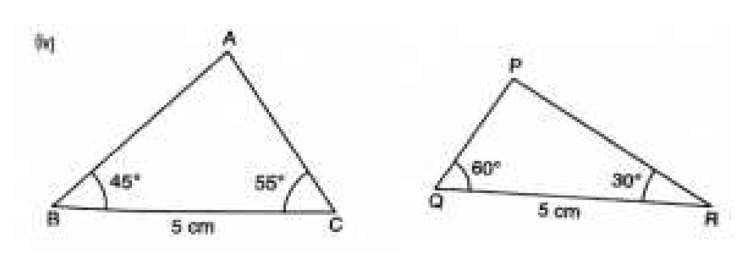
$\angle$ P = 180° – $\angle$ Q – $\angle$ R $\angle$ P = 180°- 60°- 90° = 30°

$\angle$ BAC = $\angle$ QPR = 30°

$\angle$ BCA = $\angle$ PRQ = 60°and AC = PR (Given)

Therefore, by ASA, $\Delta ABC \cong \Delta PQR$

iv)



We have only

BC = QR but none of the angles of Δ ABC and Δ PQR are equal.

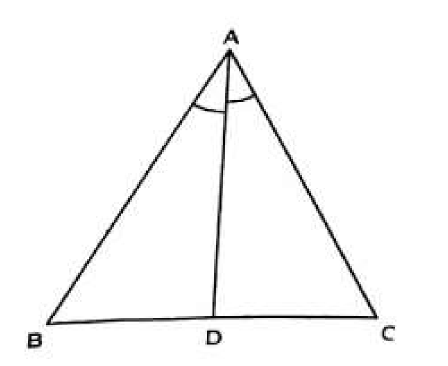
Therefore, $\Delta ABC and cong \Delta PRQ$

Q2. In figure, AD bisects A and AD and AD ⊥ BC.

(i) Is $\Delta ADB \cong \Delta ADC$?

(ii) State the three pairs of matching parts you have used in (i)

(iii) Is it true to say that BD = DC?



Answer:

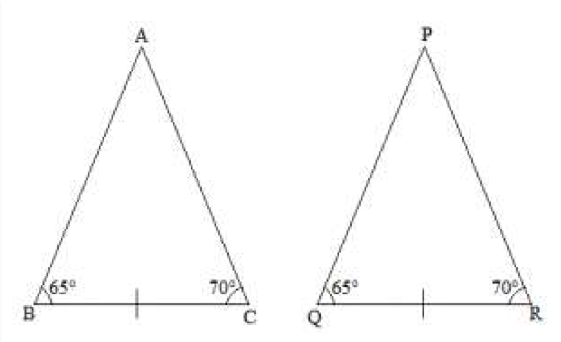
(i) Yes, $\Delta ADB \cong \Delta ADC$, by ASA criterion of congruency.

(ii) We have used $\angle$ BAD = $\angle$ CAD $\angle$ ADB = $\angle$ ADC = 90°

Since, AD ⊥ BC and AD = DA

(iii) Yes, BD = DC since, $\Delta ADB \cong \Delta ADC$

Q3. Draw any triangle ABC. Use ASA condition to construct other triangle congruent to it.



Answer:

We have drawn

Δ ABC with $\angle$ ABC = 65° and $\angle$ ACB = 70°

We now construct $\Delta PQR \cong \Delta ABC$ has $\angle$ PQR = 65° and $\angle$ PRQ = 70°

Also we construct Δ PQR such that BC = QR

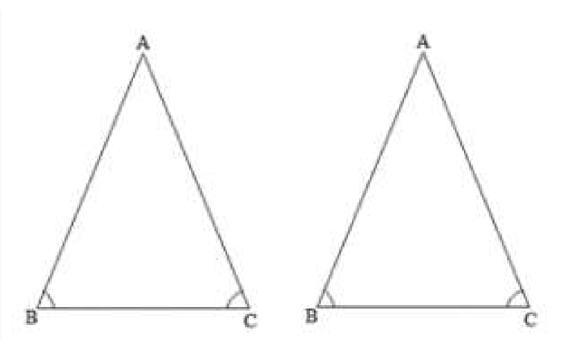
Therefore by ASA the two triangles are congruent

Q4. In Δ ABC, it is known that $\angle$ B = C. Imagine you have another copy of Δ ABC

(i) Is $\Delta ABC \cong \Delta ACB$

(ii) State the three pairs of matching parts you have used to answer (i).

(iii) Is it true to say that AB = AC?



Answer:

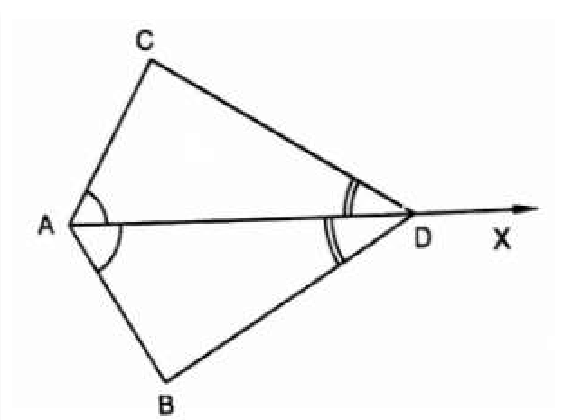
(i) Yes $\Delta ABC \cong \Delta ACB$

(ii) We have used $\angle$ ABC = $\angle$ ACB and $\angle$ ACB = $\angle$ ABC again.

Also BC = CB

(iii) Yes it is true to say that AB = AC since $\angle$ ABC = $\angle$ ACB.

Q5. In Figure, AX bisects $\angle$ BAC as well as $\angle$ BDC. State the three facts needed to ensure that $\Delta ACD \cong \Delta ABD$



Answer:

As per the given conditions, ∠ CAD = ∠ BAD and ∠ CDA = ∠ BDA (because AX bisects ∠ BAC)

AD = DA (common)

Therefore, by ASA, $\Delta ACD \cong \Delta ABD$

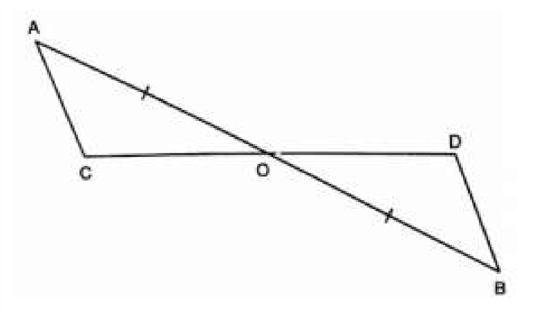
Q6. In Figure, AO = OB and ∠ A = ∠ B.

(i) Is $\Delta AOC \cong \Delta BOD$

(ii) State the matching pair you have used, which is not given in the question.

(iii) Is it true to say that ∠ ACO = ∠

BDO?



Answer:

We have

∠ OAC = ∠ OBD,

AO = OB

Also, ∠ AOC = ∠ BOD (Opposite angles on same vertex)

Therefore, by ASA $\Delta AOC \cong \Delta BOD$