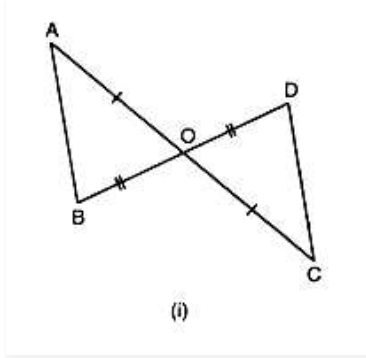# RD SHARMA

Solutions

Class 7 Maths

Chapter 16

Ex   16.3

Q1. By applying SAS congruence condition, state which of the following pairs of triangle are congruent. State the result in symbolic form
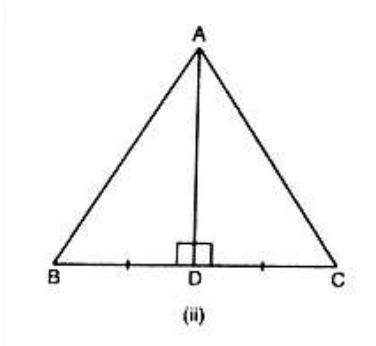
Answer:

(i)

We have OA = OC and OB = OD and

∠ AOB = ∠ COD which are vertically opposite angles. Therefore by SAS condition, $\triangle AOC \cong \triangle BOD$
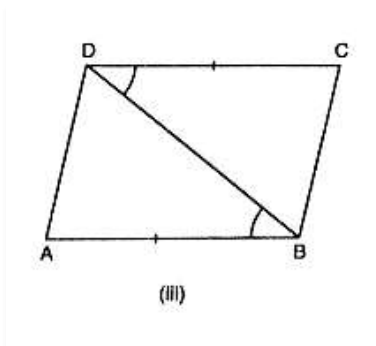
(ii)

We have BD = DC

∠ ADB = ∠ ADC = 90° and

AD = AD

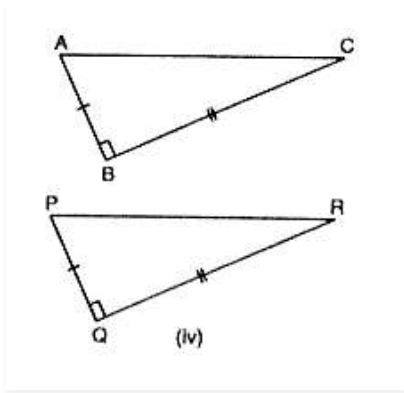Therefore, by SAS condition, $\triangle ADB \cong \triangle ADC$.

(iii)

We have AB = DC

∠ ABD = ∠ CDB and

BD = DB

Therefore, by SAS condition, $\triangle ABD \cong \triangle CBD$
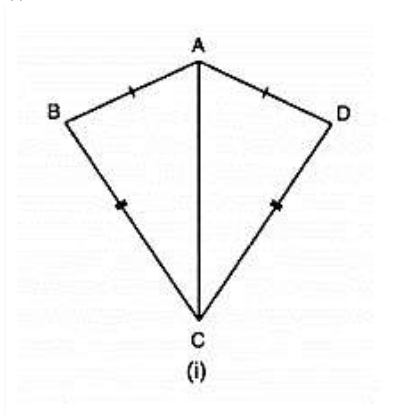
(iv)

We have BC = QR

ABC = PQR = 90°

And AB = PQ

Therefore, by SAS condition, $\triangle ABC \cong \triangle PQR$.

Q2. State the condition by which the following pairs of triangles are congruent.
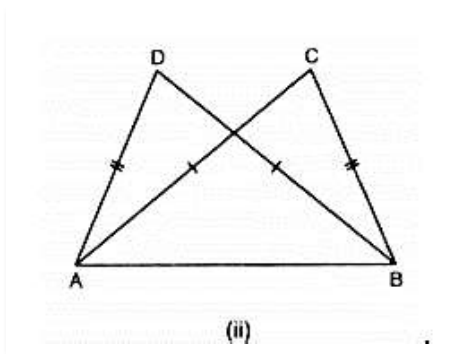
Answer:

(i)

AB = AD

BC = CD and AC = CA

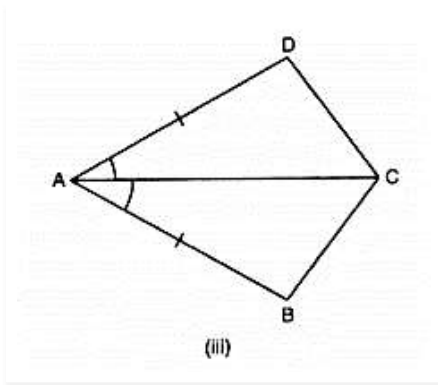Therefore by SSS condition, $\triangle ABC \cong \triangle ADC$

(ii)

AC = BD

AD = BC and AB = BA

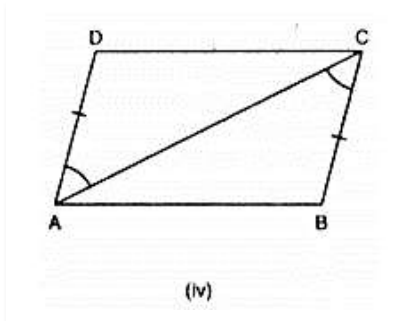Therefore, by SSS condition, $\triangle ABD \cong \triangle ADC$

(iii)

(iii)

AB = AD

∠ BAC = ∠ DAC and

AC = AC

Therefore by SAS condition, $\Delta BAC \cong \Delta BAC$

(iv)

(iv)

AD = BC

∠ DAC = ∠ BCA and

AC = CA

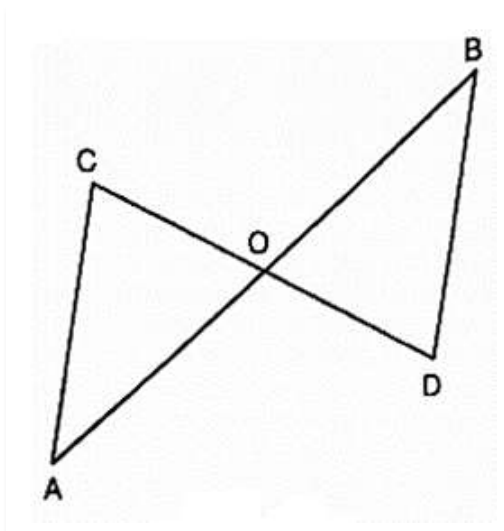Therefore, by SAS condition, $\Delta ABC \cong \Delta ADC$

Q3. In figure, line segments AB and CD bisect each other at O. Which of the following statements is true?

(i) $\Delta AOC \cong \Delta DOB$

(ii) $\Delta AOC \cong \Delta BOD$

(iii) $\Delta AOC \cong \Delta ODB$

State the three pairs of matching parts, you have used to arrive at the answer.

Answer:

We have,

And, CO = OD

Also, AOC = BOD

Therefore, by SAS condition, ΔAOC ≅ ΔBOD

Q4. Line-segments AB and CD bisect each other at O. AC and BD are joined forming triangles AOC and BOD. State the three equality relations between the parts of the two triangles that are given or otherwise known. Are the two triangles congruent? State in symbolic form, which congruence condition do you use?

Answer:

We have AO = OB and CO = OD since AB and CD bisect each other at 0.

Also ∠ AOC = ∠ BOD since they are opposite angles on the same vertex.

Therefore by SAS congruence condition, ΔAOC ≅ ΔBOD

Q5. Δ ABC is isosceles with AB = AC. Line segment AD bisects ∠ A and meets the base BC in D.

(i) Is ΔADB ≅ ΔADC?

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

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

Answer:

(i) We have AB = AC (Given)

∠BAD = ∠CAD (AD bisects ∠ BAC)

And AD = AD (common)

Therefore by SAS condition of congruence, ΔABD ≅ ΔACD

(ii) We have used AB, AC; ∠ BAD = ∠ CAD; AD, DA.
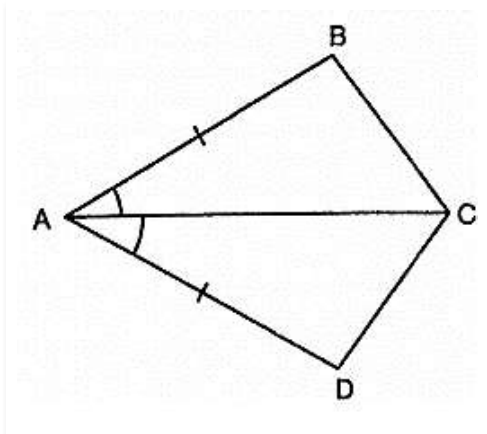
(iii) Now, ΔABD ≅ ΔACD therefore by c.p.c.t BD = DC.

Q6. In Figure, AB = AD and ∠ BAC = ∠ DAC. (i) State in symbolic form the congruence of two triangles ABC and ADC that is true.

(ii) Complete each of the following, so as to make it true:

(a) ∠ ABC =

(b) ∠ ACD =

(c) Line segment AC bisects ___ and ___

Answer:

i) AB = AD (given)

∠ BAC = ∠ DAC (given)

AC = CA (common)

Therefore by SAS condition of congruency, ΔABC ≅ ΔADC

ii) ∠ ABC = ∠ ADC (c.p.c.t)

∠ ACD = ∠ ACB (c.p.c.t)

Q7. In figure, AB ‖ DC and AB = DC.

(i) Is ΔACD ≅ΔCAB?

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

(iii) Which angle is equal to ∠ CAD ?

(iv) Does it follow from (iii) that AD ‖ BC?
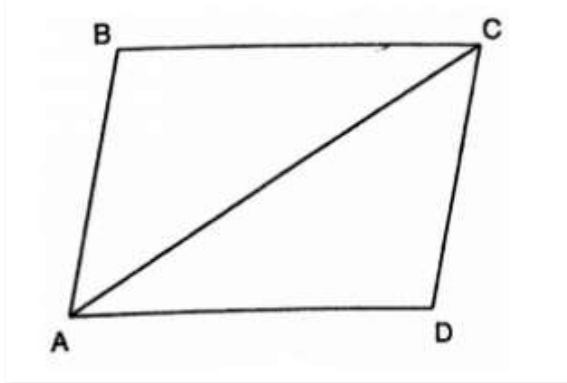
Answer:

(i) Yes by SAS condition of congruency, ΔDCA ≅ΔBAC

(ii) We have used AB = DC, AC = CA and ∠ DCA = ∠ BAC.

(iii) ∠ CAD = ∠ ACB since the two triangles are congruent.

(iv) Yes this follows from AD ∕∕ BC as alternate angles are equal. If alternate angles are equal the lines are parallel