RD SHARMA

Solutions

Class 7 Maths

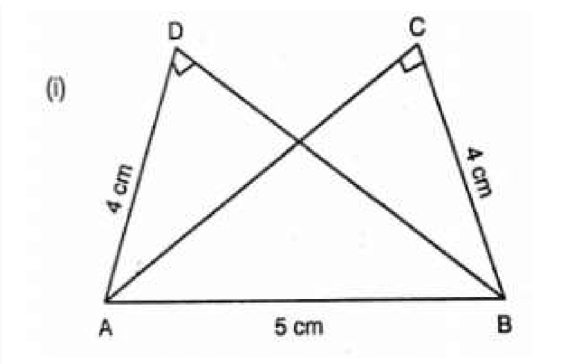
Chapter 16

Ex 16.5

Q1. In each of the following pairs of right triangles, the measures of some part are indicated along side. State by the application of RHS congruence conditions which are congruent, and also state each result in symbolic form.

Answer:

i)

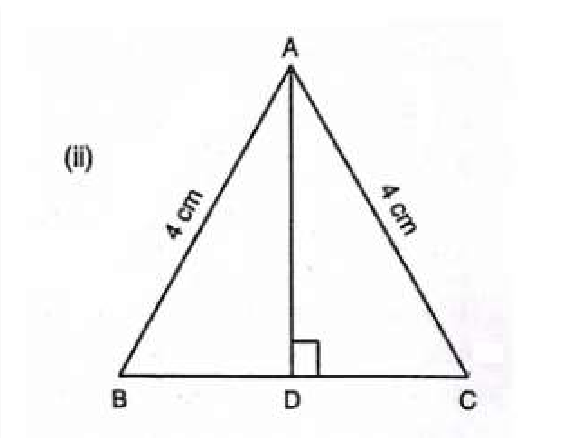


∠ ADC = ∠ BCA = 90°

AD = BC and hyp AB = hyp AB

Therefore, by RHS $\Delta ADB \cong \Delta ACB$

ii)



AD = AD (Common)

hyp AC = hyp AB (Given)

∠ ADB + ∠ ADC = 180° (Linear pair)

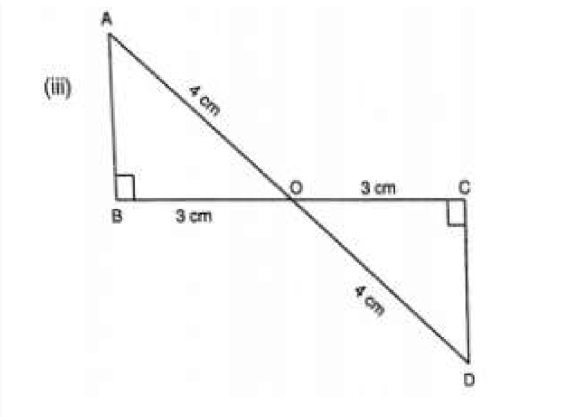
∠ ADB + 90° = 180°

∠ ADB = 180° – 90° = 90°

∠ ADB = ∠ ADC = 90°

Therefore, by RHS Δ ADB = Δ ADC

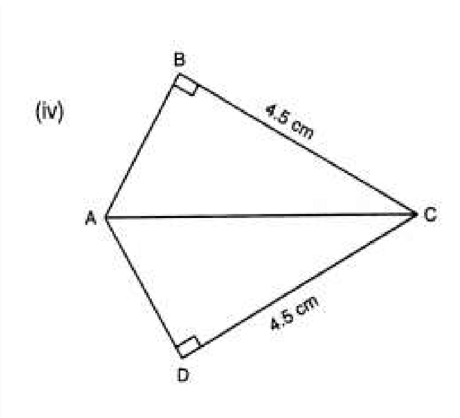
iii)



hyp AO = hyp DOBO = CO ∠ B = ∠ C = 90°

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

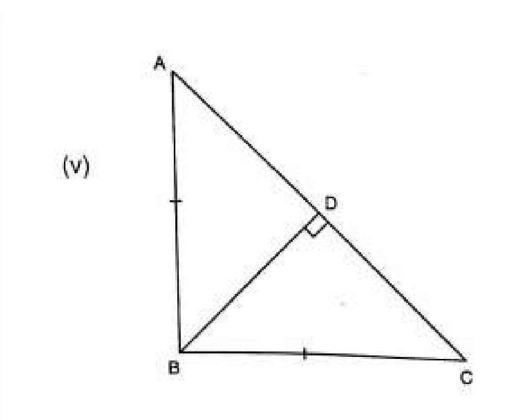
iv)



Hyp A = Hyp CABC = DC ∠ ABC = ∠ ADC = 90°

Therefore, by RHS, $\Delta ABC \cong \Delta ADC$

v)



BD = DB Hyp AB = Hyp BC, as per the given figure,

∠ BDA + ∠ BDC = 180°

∠ BDA + 90° = 180°

∠ BDA= 180°- 90° = 90°

∠ BDA = ∠ BDC = 90°

Therefore, by RHS, $\Delta ABD \cong \Delta CBD$

Q2. Δ ABC is isosceles with AB = AC. AD is the altitude from A on BC.

i) Is$\Delta ABD \cong \Delta ACD$?

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

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

Answer:

(i)Yes, $\Delta ABD \cong \Delta ACD$ by RHS congruence condition.

(ii) We have used Hyp AB = Hyp AC

AD = DA

∠ ADB = ∠ ADC = 90° (AD ⊥ BC at point D)

(iii)Yes, it is true to say that BD = DC (c.p.c.t) since we have already proved that the two triangles are congruent.

Q3. Δ ABC is isosceles with AB = AC. Also. AD ⊥ BC meeting BC in D. Are the two triangles ABD and ACD congruent? State in symbolic form. Which congruence condition do you use? Which side of ADC equals BD? Which angle of Δ ADC equals ∠ B?

Answer:

We have AB = AC …… (i)

AD = DA (common) ……(ii)

And, ∠ ADC = ∠ ADB (AD ⊥ BC at point D) ……(iii)

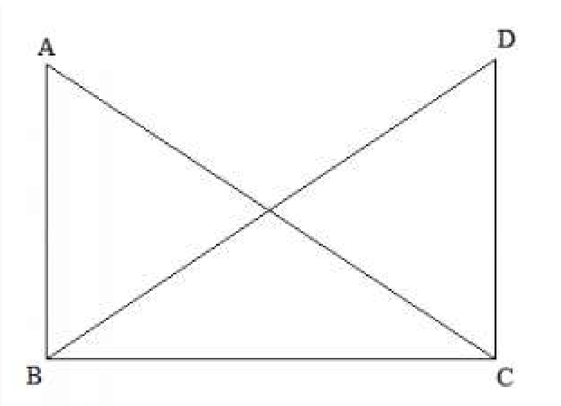
Therefore, from (i), (ii) and (iii), by RHS congruence condition, $\Delta ABD \cong \Delta ACD$, the triangles are congruent.

Therefore, BD = CD.

And ∠ ABD = ∠ ACD (c.p.c.t)

Q4. Draw a right triangle ABC. Use RHS condition to construct another triangle congruent to it.

Answer:



Consider

Δ ABC with ∠ B as right angle.

We now construct another triangle on base BC, such that ∠ C is a right angle and AB = DC

Also, BC = CB

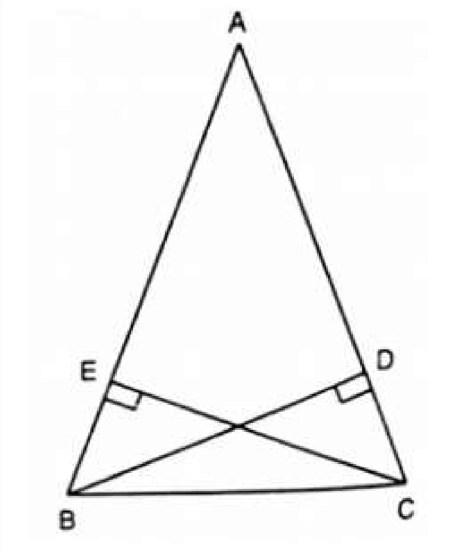
Therefore, BC = CB

Therefore by RHS, $\Delta ABC \cong \Delta DCB$

Q5. In figure, BD and CE are altitudes of Δ ABC and BD = CE.

(i) Is $\Delta BCD \cong \Delta CBE$?

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



Answer:

(i) Yes, $\Delta BCD \cong \Delta CBE$ by RHS congruence condition.

(ii) We have used hyp BC = hyp CB

BD = CE (Given in question)

And ∠ BDC = ∠ CBE = 90º