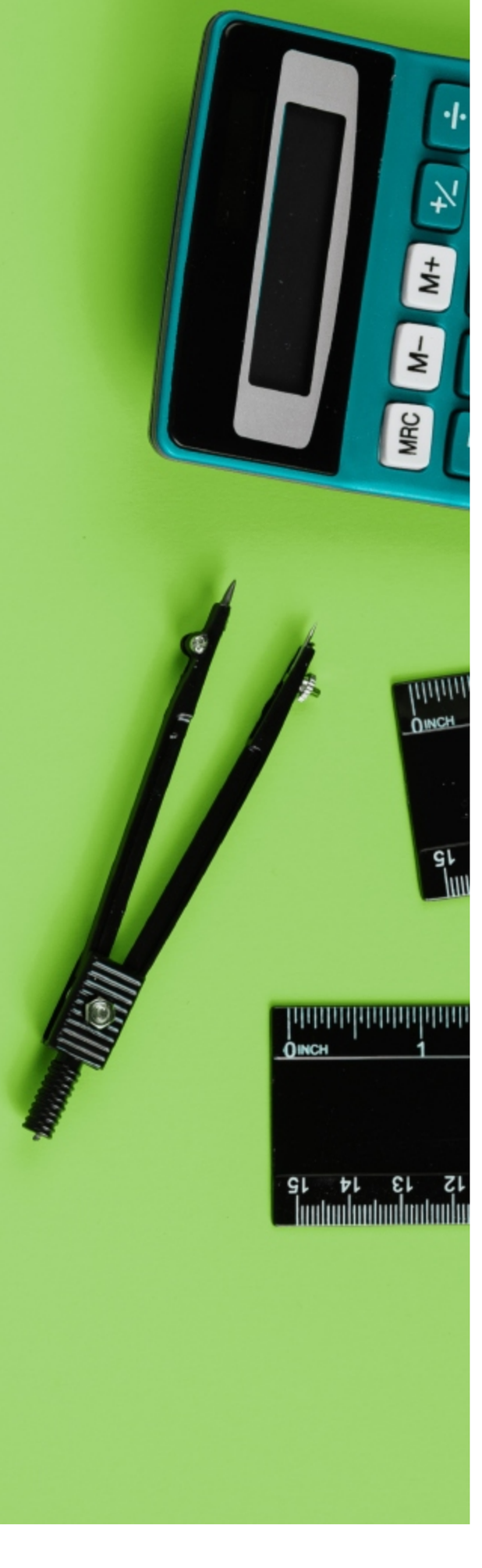
RD Sharma Solutions

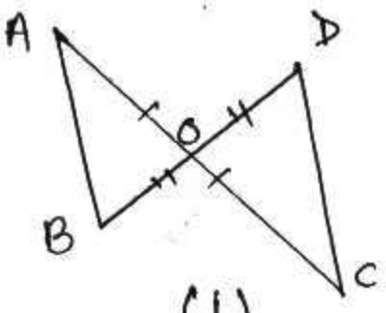
Class 7

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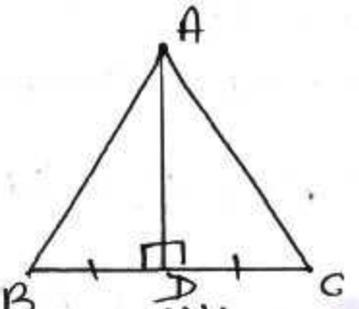


Exercise 16.3

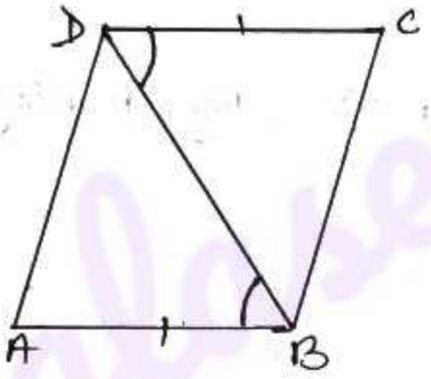
Q.1 By Applying SAS congruence condition, State which of the following pairs of triangles are congruent. State the result in Symbolic form.



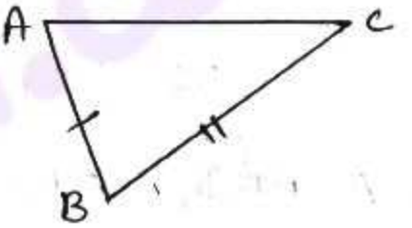
(i)

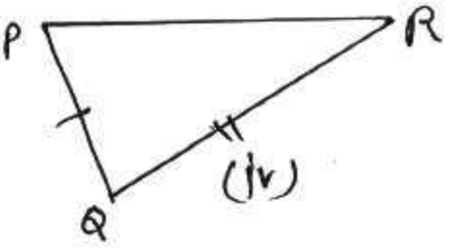


(ii)



(iii)





(iv)

Solution: (i) In $\triangle AOB$ and $\triangle COD$

$OA = OC$

$\angle AOB = \angle COD$ (vertically opp. angles)

$OB = OD$

By SAS $\triangle AOB \cong \triangle COD$

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(ii) In $\triangle ABD$ and $\triangle ACD$

$BD = CD$

$\angle ADB = \angle ADC$ $(90°)$

$AD = DA$ (common)

By SAS $\triangle ABD \cong \triangle ACD$

(iii) In $\triangle ABD$ and $\triangle CDB$

$AB = CD$

$\angle ABD = \angle BDC$ (alternate angles)

$BD = DB$

By SAS $\triangle ABD \cong \triangle CDB$

(iv) In $\triangle ABC$ and $\triangle PQR$

$AB = PQ$

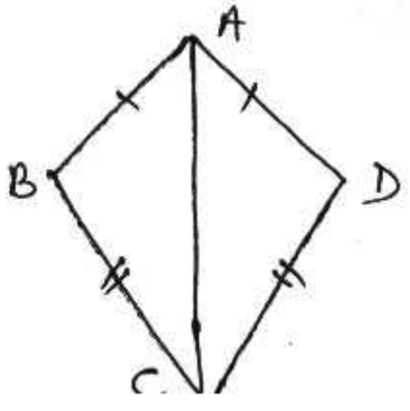
$\angle B = \angle Q$ $(90°)$

$BC = QR$

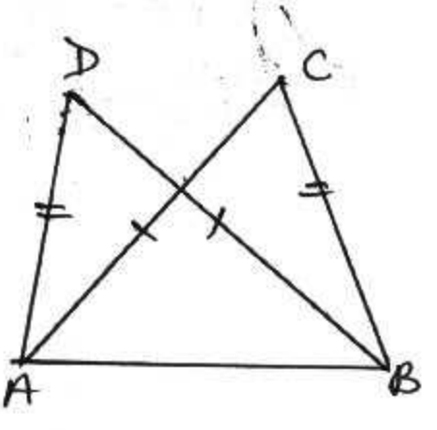
By SAS $\triangle ABC \cong \triangle PQR$

Q.2 State the condition by which the following pairs of triangles are congruent.

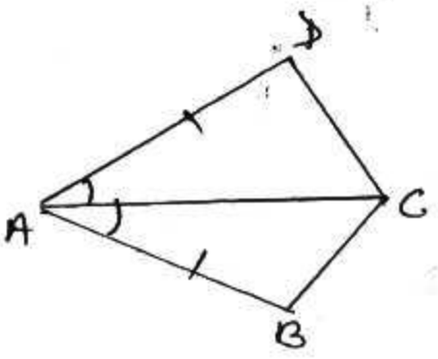
(i)

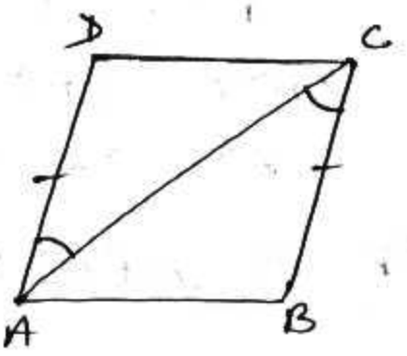


(ii)



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Solution: (i) In $\triangle ABC$ and $\triangle ADC$

$AB = AD$

$BC = DC$

$AC = CA$ (common)

By SSS $\triangle ABC \cong \triangle ADC$

(ii) In $\triangle ABD$ and $\triangle BAC$

$AD = BC$

$BD = AC$

$AB = BA$ (Common)

By SSS $\triangle ABD \cong \triangle BAC$

(iii) In $\triangle ABC$ and $\triangle ADC$

$AB = AD$ (given)

$\angle DAC = \angle BAC$

$AC = CA$ (common)

By SAS $\triangle ABC \cong \triangle ADC$

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(iv) In $\triangle ABC$ and $\triangle CAD$

$AD = BC$

$\angle DAC = \angle BCA$

$AC = CA$ (Common)

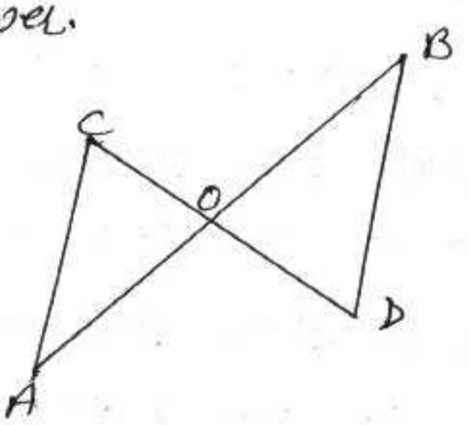
By SAS $\triangle ABC \cong \triangle CAD$

Q.3 In fig. 30, line segments AB and CD bisect each other at O. Which of the following statement is true ?

(i) $\triangle AOC \cong \triangle DOB$ (ii) $\triangle AOC \cong \triangle BOD$

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

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



Solution : There (i) and (ii) Parts are correct.

here $OA = OB$

$OC = OD$

$\angle AOC = \angle BOD$ (Vertically opposite angles)

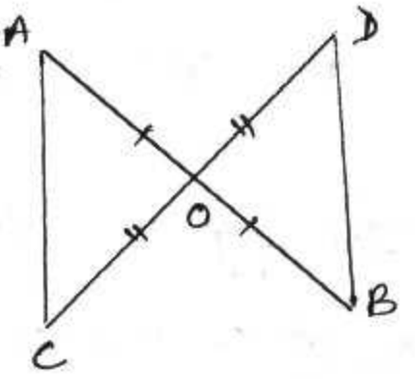
Q.4 Line segments AB and CD bisect each other at O. AC and BD are joined forming triangles AOC and BOD. State the three equality relations between the parts of the following triangles, that are given or otherwise unknown.

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Are the two triangles congruent? State in symbolic form. which congruent condition do you use?

Solution:



Three equality relations are

$OA = OB$

$OC = OD$

and $\angle AOC = \angle BOD$ (vertically opposite)

Yes BY SAS

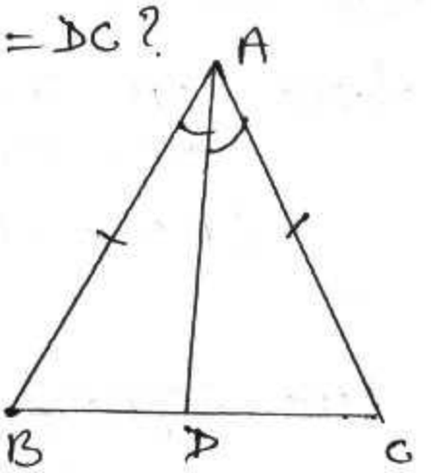
$\triangle AOC \cong \triangle BOD$

Q.5 $\triangle ABC$ is isosceles with $AB = AC$. Line segment AD bisects $\angle A$ and meets the base BC in D.

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

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

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



Solution: (i) Yes. $\triangle ADB \cong \triangle ADC$

here AD bisects $\angle A$

$\therefore \angle BAD = \angle CAD$

(i) In $\triangle ADB$ and $\triangle ADC$

$AB = AC$

$\angle BAD = \angle CAD$

$AD = DA$ (common)

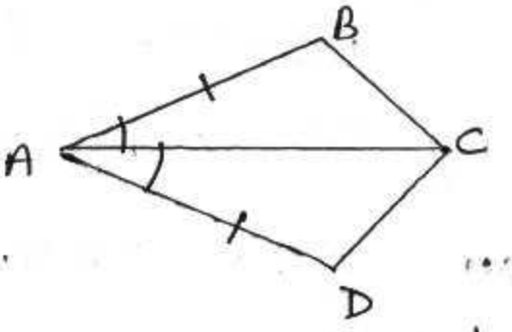
BY SAS $\triangle ADB \cong \triangle ADC$

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(iii) Yes, $BD = DC$ (corresponding parts of congruent triangles are equal)

Q.6 In fig. 31, $AB = AD$ and $\angle BAC = \angle DAC$



(i) State in symbolic form the congruence of two triangles ABC and $\triangle ADC$ that is true.

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

(a) $\angle ABC =$ ------ (b) $\angle ACD =$ ------

(c) Line segment AC bisects ---- and ------

Solution: (i) $\triangle ABC \cong \triangle ADC$

(ii) (a) $\angle ABC = \angle ADC$

(b) $\angle ACD = \angle ACB$

(c) Line segment AC bisects $\angle A$ and $\angle C$

Q.7 In fig 32, $AB \parallel DC$ and $AB = DC$

(i) Is $\triangle ACD \cong \triangle CAB$

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

(iii) which angle is equal to $\angle CAD$?

(iv) Does it follow from (iii) that $AD \parallel BC$?

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Solution : (I) Yes, $\triangle ACD \cong \triangle CAB$

(II) $AB = CD$

$\angle BAC = \angle ACD$ (alternate angles)

$AC = CA$ (common side)

By SAS $\triangle ACD \cong \triangle CAB$

(III) $\angle CAD = \angle ACB$

(IV) Yes, $\because \angle CAD$ & $\angle ACB$ are alternate angles.

$\therefore AD \parallel BC$

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