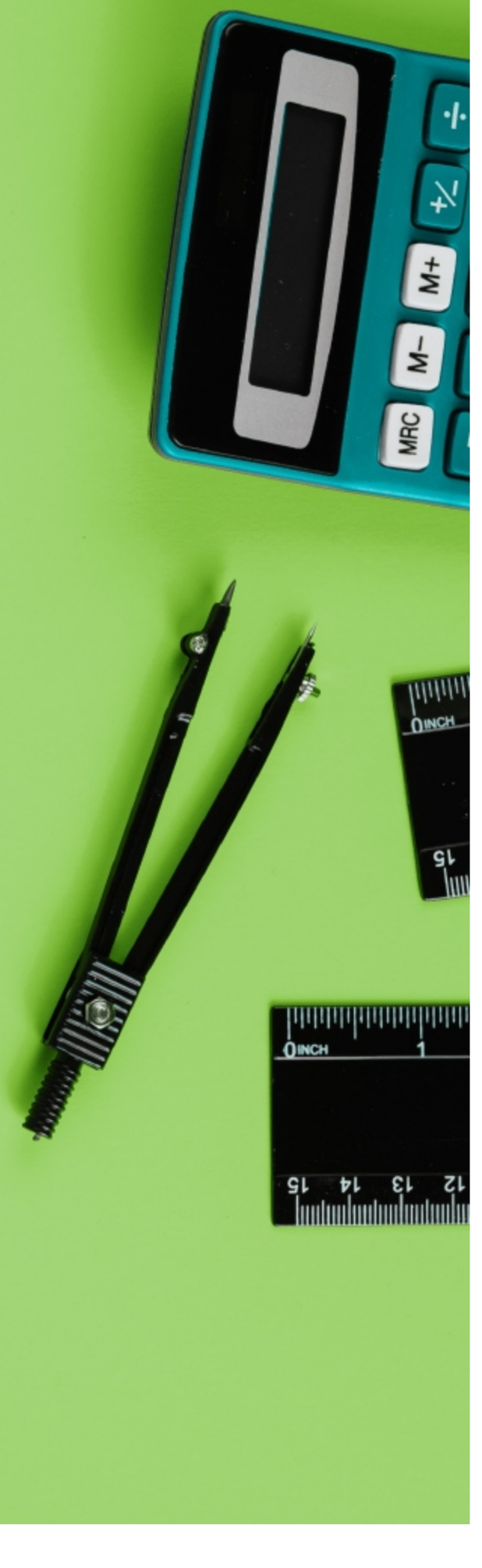
RD Sharma Solutions

Class 7

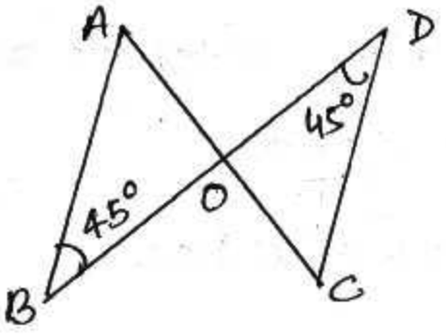
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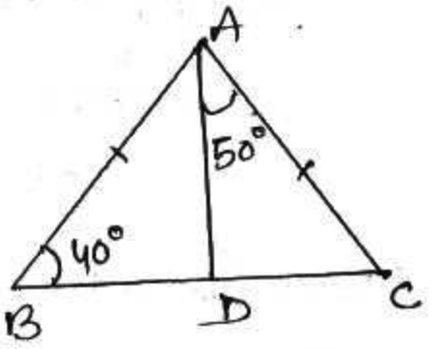


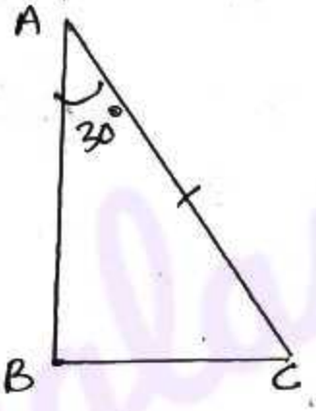
Exercise 16.4

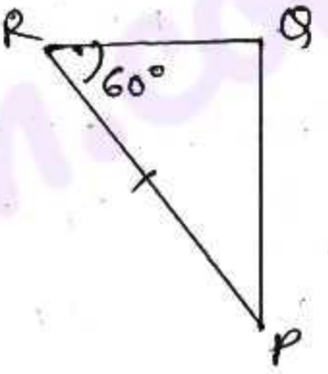
Q.1 Which of the following pairs of triangles are congruent by ASA condition?

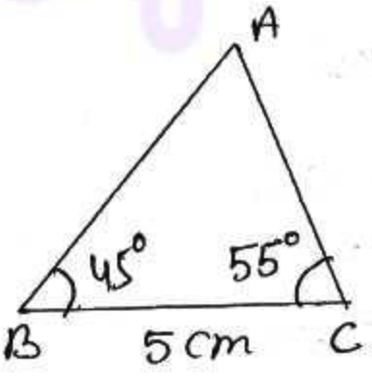
(i)

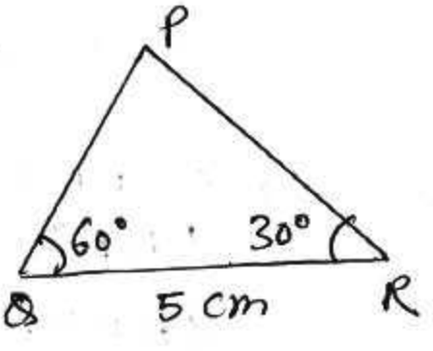












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Solution: (i) In $\triangle AOB$ and $\triangle$ COD

$\because \angle ABO = \angle CDO = 45^\circ$ and these are alternate angles

$\therefore AB \parallel CD$

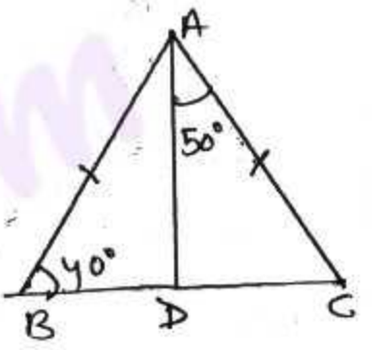
Therefore $\angle BAO = \angle DCO$ (alternate angles)

also $AB = DC$ (given)

Therefore, By ASA $\triangle AOB \cong \triangle DOC$

(ii) In $\triangle ABC$, $AB = AC$ (given)

$\therefore \angle ABD = \angle ACD = 40^\circ$



In $\triangle ABC$, $\angle A + \angle B + \angle C = 180^\circ$

$\Rightarrow \angle A + 40^\circ + 40^\circ = 180^\circ$

$\Rightarrow \angle A = 180 - 80^\circ = 100^\circ$

$\because \angle BAD + \angle CAD = \angle A$

$\Rightarrow \angle BAD + 50^\circ = 100^\circ$

$\Rightarrow \angle BAD = 100^\circ$

Now In $\triangle ABD$ and $\triangle ACD$

$\angle BAD = \angle CAD$ (50°)

$\angle ABD = \angle ACD$ (40°)

$AB = AC$

By ASA $\triangle ABD \cong \triangle ACD$

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(iii) here In $\triangle ABC$, $\angle A = 30°$, $\angle B = 90°$

$\because \angle A + \angle B + \angle C = 180°$

$\Rightarrow 30° + 90° + \angle C = 180°$

$\Rightarrow 120° + \angle C = 180° \Rightarrow \angle C = 180° - 120°$

$= 60°$

Applying the same concept in $\triangle PQR$, we get

$\angle P = 30°$

Now In $\triangle ABC$ and $\triangle PQR$

$\angle A = \angle P$

$\angle C = \angle R$

$AC = PR$

By ASA $\triangle ABC \cong \triangle PQR$.

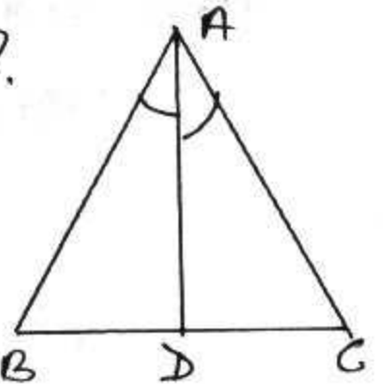
(iv) No, these are not. Congruent triangles.

Q.2 In fig. 37, AD bisects $\angle A$ and $AD \perp BC$.

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

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

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



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Solution:

Here AD bisects $\angle A$

$\therefore \angle BAD = \angle CAD$

also $AD \perp BC$, $\angle ADB = \angle ADC$ ($90°$)

(i) Yes, $\triangle ADB \cong \triangle ADC$

(ii) $\angle BAD = \angle CAD$ ($\because$ AD bisects $\angle A$)

$\angle ADB = \angle ADC$ ($90°$)

$AD = AD$ (Common)

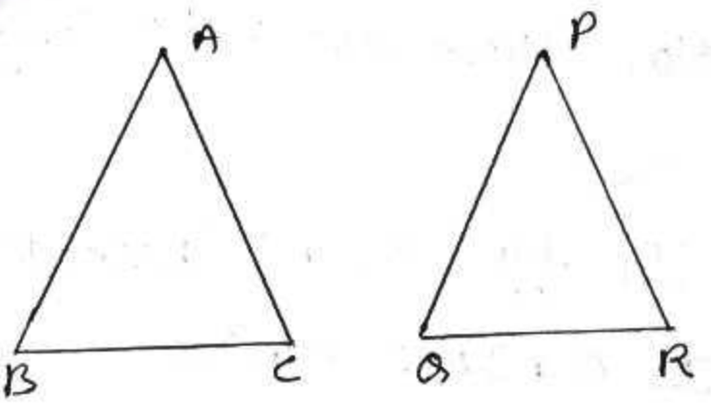
By ASA $\triangle ADB \cong \triangle ADC$

(iii) Yes, $BD = DC$.

Q.3 Draw any triangle ABC. Use ASA condition to construct another triangle congruent to it.

Solution:

Let we draw $\triangle ABC$



Now to construct

$\triangle PQR \cong \triangle ABC$

Draw a line $QR = BC$.

Now make $\angle RQP = \angle CBA$ and $\angle QRP = \angle BCA$.

Then $\triangle PQR$ is congruent to $\triangle ABC$.

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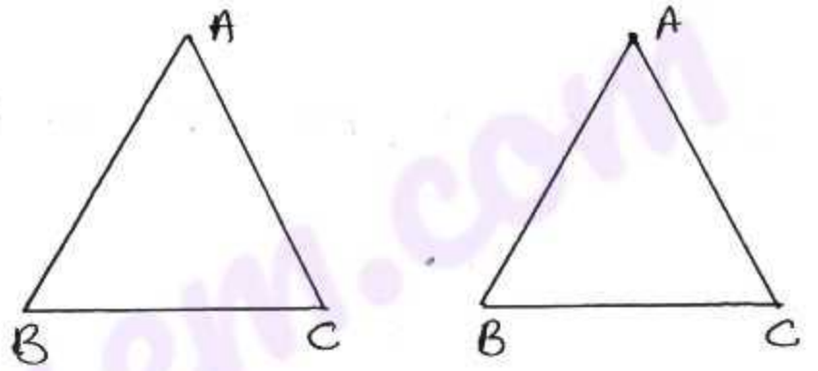
Q.4 In $\triangle ABC$, it is known that $\angle B = \angle C$. Imagine you have another copy of $\triangle ABC$

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

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

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

Solution:



In $\triangle ABC$

$\because \angle B = \angle C$

$\Rightarrow AC = AB$

(∵ The sides opposite to equal angles of triangle are also equal)

(i) Yes, $\triangle ABC \cong \triangle ACB$

(ii) $AB = AC$

$\angle B = \angle C$

$BC = BC$ (common).

(iii) Yes, $AB = AC$ as $\angle B = \angle C$

Q.5 In fig. 38, AX bisects $\angle BAC$ as well as $\angle BDC$. State the three facts needed to ensure that $\triangle ABD \cong \triangle ACD$

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Solution:

In $\triangle ABD$ and $\triangle ACD$

$\angle BAD = \angle CAD$

$\angle BDA = \angle CDA$

$AD = DA$

By ASA $\triangle ABD \cong \triangle ACD$

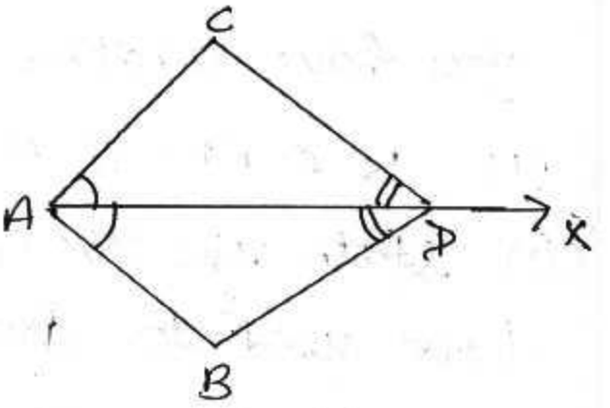
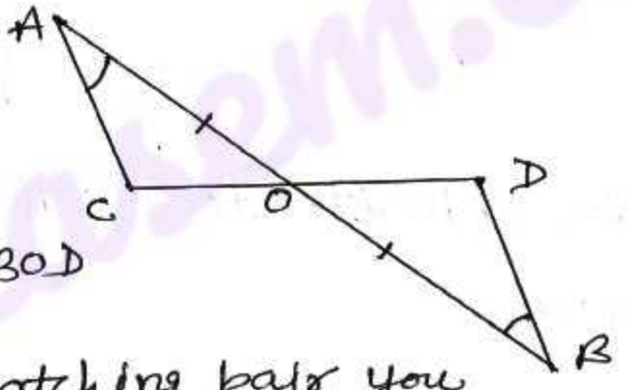


Fig. 38

Q.6 In fig 39, $AO = OB$ and $\angle A = \angle B$



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

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

(iii) Is it true to say that $\angle ACO = \angle BDO$?

Solution: (i) Yes $\triangle AOC \cong \triangle BOD$

(ii) $AO = BO$

$\angle A = \angle B$

$\angle AOC = \angle BOD$

By ASA $\triangle AOC \cong \triangle BOD$

(iii) Yes. $\angle ACO = \angle BDO$

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