



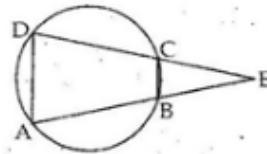
Exercise 11C

Question 16:

Consider the triangles, $\triangle EBC$ and $\triangle EDA$

Side AB of the cyclic quadrilateral ABCD is produced to E

$$\begin{aligned} \therefore \quad & \angle EBC = \angle CDA \\ \Rightarrow \quad & \angle EBC = \angle EDA \quad \dots\dots(i) \end{aligned}$$



Again, side DC of the cyclic quadrilateral ABCD is produced to E.

$$\begin{aligned} \therefore \quad & \angle ECB = \angle BAD \\ \Rightarrow \quad & \angle ECB = \angle EAD \quad \dots\dots(ii) \\ \text{and} \quad & \angle BEC = \angle DEA \quad [\text{each equal to } \angle E] \dots\dots(iii) \end{aligned}$$

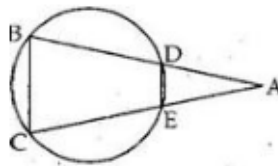
Thus from (i), (ii) and (iii), we have

$$\therefore \quad \triangle EBC \cong \triangle EDA$$

Question 17:

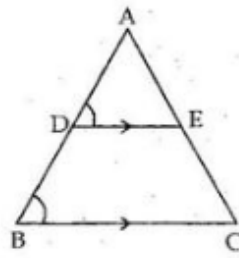
$\triangle ABC$ is an isosceles triangle in which $AB = AC$ and a circle passing through B and C intersects AB and AC at D and E.

$$\begin{aligned} \text{Since} \quad & AB = AC \\ \therefore \quad & \angle ACB = \angle ABC \\ \text{So, ext.} \quad & \angle ADE = \angle ACB = \angle ABC \\ \therefore \quad & \angle ADE = \angle ABC \\ \Rightarrow \quad & DE \parallel BC. \end{aligned}$$



Question 18:

$\triangle ABC$ is an isosceles triangle in which $AB = AC$. D and E are the mid points of AB and AC respectively.



$\therefore DE \parallel BC$
 $\Rightarrow \angle ADE = \angle ABC$ (i)
 Also, $AB = AC$ [Given]
 $\Rightarrow \angle ABC = \angle ACB$ (ii)
 $\therefore \angle ADE = \angle ACB$ [From (i) and (ii)]
 Now, $\angle ADE + \angle EDB = 180^\circ$ [\because ADB is a straight line]
 $\therefore \angle ACB + \angle EDB = 180^\circ$
 \Rightarrow The opposite angles are supplementary.
 \Rightarrow D, B, C and E are concyclic
 i.e. D, B, C and E is a cyclic quadrilateral.

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