Exercise 11C

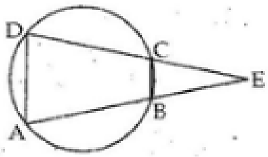
Question 16:

Consider the triangles, ΔEBC and ΔEDA

Side AB of the cyclic quadrilateral ABCD is produced to E

$\therefore \quad \angle EBC = \angle CDA$

$\Rightarrow \quad \angle EBC = \angle EDA \quad .....(i)$



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

$\therefore \quad \angle ECB = \angle BAD$

$\Rightarrow \quad \angle ECB = \angle EAD \quad .....(ii)$

and $\quad \angle BEC = \angle DEA \quad$ [each equal to $\angle E$]....(iii)

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

$\therefore \quad \Delta EBC \cong \Delta EDA$

Question 17:

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

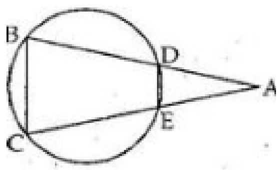
Since $\quad AB = AC$

$\therefore \quad \angle ACB = \angle ABC$

So, ext. $\quad \angle ADE = \angle ACB = \angle ABC$

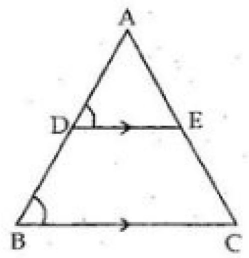
$\therefore \quad \angle ADE = \angle ABC$

$\Rightarrow \quad DE \parallel BC.$



Question 18:

ΔABC is an isosceles trianglein which AB = AC. D and E are the mid points of AB and AC respectively.



$\therefore \quad DE \parallel BC$

$\Rightarrow \quad \angle ADE = \angle ABC \quad .....(i)$

Also, $\quad AB = AC \quad$ [Given]

$\Rightarrow \quad \angle ABC = \angle ACB \quad .....(ii)$

$\therefore \quad \angle ADE = \angle ACB \quad$ [From (i) and (ii)]

Now, $\angle ADE + \angle EDB = 180° \quad$ [$\because$ ADB is a straightline]

$\therefore \quad \angle ACB + \angle EDB = 180°$

$\Rightarrow$ The opposite angles are supplementary.

$\Rightarrow$ D, B, C and E are concyclic

i.e. D, B, C and E is a cyclic quadrilateral.

*********** END **********