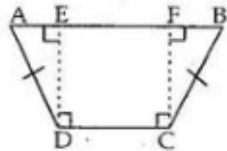




Exercise 11C

Question 24:

ABCD is a quadrilateral in which $AD = BC$ and $\angle ADC = \angle BCD$
 Draw $DE \perp AB$ and $CF \perp AB$



Now, in $\triangle ADE$ and $\triangle BCF$, we have

$$\angle AED = \angle BFC \quad [\text{each equal to } 90^\circ]$$

$$\angle ADE = \angle ADC - 90^\circ = \angle BCD - 90^\circ = \angle BCF$$

$$AD = BC \quad [\text{given}]$$

Thus, by Angle-Angle-Side criterion of congruence, we have

$$\therefore \triangle ADE \cong \triangle BCF \quad [\text{by AAS congruence}]$$

The corresponding parts of the congruent triangles are equal.

$$\therefore \angle A = \angle B$$

$$\text{Now, } \angle A + \angle B + \angle C + \angle D = 360^\circ$$

$$\Rightarrow 2\angle B + 2\angle D = 360^\circ$$

$$\Rightarrow 2(\angle B + \angle D) = 360^\circ$$

$$\Rightarrow \angle B + \angle D = \frac{360}{2} = 180^\circ$$

$$\therefore ABCD \text{ is a cyclic quadrilateral.}$$

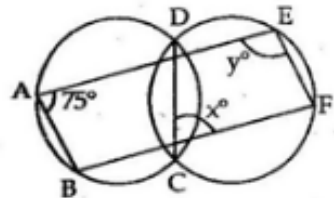
Question 25:

If one side of a cyclic quadrilateral is produced then the exterior angle is equal to the interior opposite angle.

$$\Rightarrow \angle BAD = \angle DCF = 75^\circ$$

$$\therefore \angle DCF = x = 75^\circ$$

$$\therefore x = 75^\circ$$



The opposite angles of the opposite angles of a cyclic quadrilateral is 180°

$$\Rightarrow \angle DCF + \angle DEF = 180^\circ$$

$$\Rightarrow 75^\circ + \angle DEF = 180^\circ$$

$$\Rightarrow \angle DEF = 180^\circ - 75^\circ = 105^\circ$$

$$\text{As } \angle DEF = y^\circ = 105^\circ$$

$$\therefore x = 75^\circ \text{ and } y = 105^\circ$$

***** END *****

