

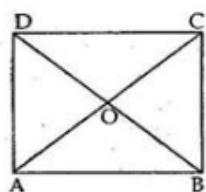


### Exercise 11C

Question 21:

ABCD is a rectangle.

Let O be the point of intersection of the diagonals AC and BD of rectangle ABCD.



Since the diagonals of a rectangle are equal and bisect each other,

$$\therefore OA = OB = OC = OD$$

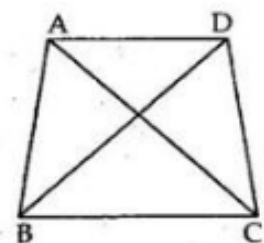
Thus, O is the centre of the circle through A, B, C, D.

Question 22:

Let A, B, C be the given points.

With B as centre and radius equal to AC draw an arc.

With C as centre and AB as radius draw another arc, which cuts the previous arc at D.



Then D is the required point BD and CD.

In  $\triangle ABC$  and  $\triangle DCB$

$$AB = DC$$

$$AC = DB$$

$$BC = CB \quad [\text{common}]$$

$$\therefore \triangle ABC \cong \triangle DCB \quad [\text{by SSS}]$$

$$\Rightarrow \angle BAC = \angle CDB \quad [\text{C.P.C.T}]$$

Thus, BC subtends equal angles,  $\angle BAC$  and  $\angle CDB$  on the same side of it.

$\therefore$  Points A, B, C, D are concyclic.

Question 23:

ABCD is a cyclic quadrilateral

$$\angle B - \angle D = 60^\circ \quad \dots\dots(i)$$

and  $\angle B + \angle D = 180^\circ \quad \dots\dots(ii)$

Adding (i) and (ii) we get,

$$2\angle B = 240^\circ$$

$$\therefore \angle B = \frac{240}{2} = 120^\circ$$

Substituting the value of  $\angle B = 120^\circ$  in (i) we get

$$120^\circ - \angle D = 60^\circ$$

$$\Rightarrow \angle D = 120^\circ - 60^\circ = 60^\circ$$

The smaller of the two angles i.e.  $\angle D = 60^\circ$

\*\*\*\*\* END \*\*\*\*\*