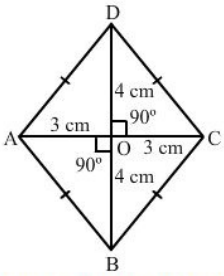
Understanding shapes-III special types of quadrilaterals Ex 17.2 Q14

Answer :



Let the given quadrilateral be ABCD in which diagonals AC is equal to 6 cm and BD is equal to 8 cm.

Also, it is given that the diagonals bisect each other at right angle, at point O.

$\therefore$ AO = OC = $\frac{1}{2}$ AC = 3 cm

Also, OB = OD = $\frac{1}{2}$ BD = 4 cm

In right $\triangle$ AOB :

$AB^2 = OA^2 + OB^2$

$\Rightarrow AB^2 = \left(9+16\right)\ cm^2$

$\Rightarrow AB^2 = 25\ cm^2$

$\Rightarrow AB = 5$ cm

Thus, the length of each side of the quadrilateral is 5 cm.

$$AB^2 = AO^2 + BO^2$$

$$\Rightarrow AO^2 = \left(AB^2 - BO^2\right)$$

$$\Rightarrow AO^2 = \left(10\right)^2 - \left(8\right)^2\ cm^2$$

$$\Rightarrow AO^2 = \left(100 - 64\right)\ cm^2 = 36\,cm^2$$

$$\Rightarrow AO = \sqrt{36}\ cm = 6cm$$

$$\therefore AC = 2 \times AO = \left(2 \times 6\right)\ cm = 12\ \ cm$$

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