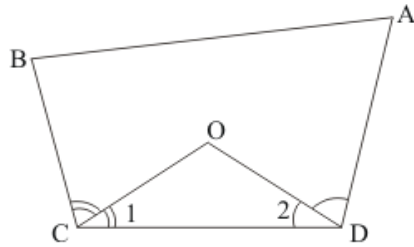




Quadrilaterals Ex 14.1 Q3

Answer :

The quadrilateral can be drawn as follows:



We have CO and DO as the bisectors of angles $\angle C$ and $\angle D$ respectively.

We need to prove that $\angle COD = \frac{1}{2}(\angle A + \angle B)$.

In $\triangle COD$, We have,

$$\angle COD + \angle 1 + \angle 2 = 180^\circ$$

$$\angle COD = 180^\circ - (\angle 1 + \angle 2)$$

$$\angle COD = 180^\circ - \left(\frac{1}{2}\angle C + \frac{1}{2}\angle D\right)$$

$$\angle COD = 180^\circ - \frac{1}{2}(\angle C + \angle D) \dots\dots (1)$$

By angle sum property of a quadrilateral, we have:

$$\angle A + \angle B + \angle C + \angle D = 360^\circ$$

$$\angle C + \angle D = 360^\circ - (\angle A + \angle B)$$

Putting in equation (1):

$$\angle COD = 180^\circ - \frac{1}{2}[360^\circ - (\angle A + \angle B)]$$

$$\angle COD = 180^\circ - 180^\circ + \frac{(\angle A + \angle B)}{2}$$

$$\boxed{\angle COD = \frac{1}{2}(\angle A + \angle B)}$$

Hence proved.

***** END *****