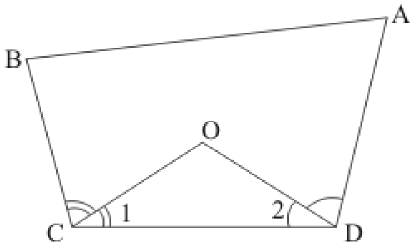
Quadrilaterals Ex 14.1 Q3

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,

$$\angle COD + \angle 1 + \angle 2 = 180^0$$
$$\angle COD = 180^0 - (\angle 1 + \angle 2)$$
$$\angle COD = 180^0 - (\frac{1}{2}\angle C + \frac{1}{2}\angle D)$$
$$\angle COD = 180^0 - \frac{1}{2}(\angle C + \angle D) \quad \ldots\ldots (I)$$

By angle sum property of a quadrilateral, we have:

$$\angle A + \angle B + \angle C + \angle D = 360^0$$
$$\angle C + \angle D = 360^0 - (\angle A + \angle B)$$

Putting in equation (I):

$$\angle COD = 180^0 - \frac{1}{2}\left[360^0 - (\angle A + \angle B)\right]$$
$$\angle COD = 180^0 - 180^0 + \frac{(\angle A + \angle B)}{2}$$
$$\boxed{\angle COD = \frac{1}{2}(\angle A + \angle B)}$$

Hence proved.

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