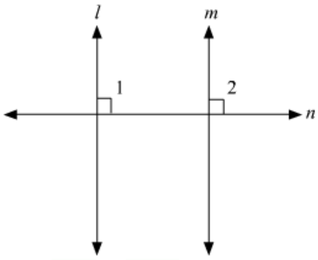
Lines and Angles Ex 8.4 Q17

Answer :

The figure can be drawn as follows:



Here, $l \perp n$ and $m \perp n$.

We need to prove that $l \| m$

It is given that $l \perp n$, therefore,

$\angle 1 = 90^0$ (i)

Similarly, we have $m \perp n$, therefore,

$\angle 2 = 90^0$ (ii)

From (i) and (ii), we get:

$\angle 1 = \angle 2$

But these are the pair of corresponding angles.

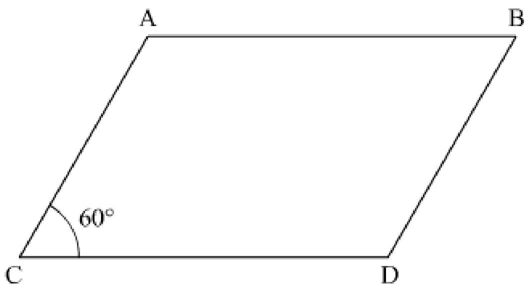
Theorem states: If a transversal intersects two lines in such a way that a pair of corresponding angles is equal, then the two lines are parallel.

Thus, we can say that $l \| m$.

Lines and Angles Ex 8.4 Q18

Answer :

The quadrilateral can be drawn as follows:



Here, we have $AB \| CD$ and $AC \| BD$.

Also, $\angle ACD = 60^0$.

Since, $AB \| CD$. Thus, $\angle ACD$ and $\angle BAC$ are consecutive interior angles.

Thus these two must be supplementary. That is,

$$\begin{aligned}\angle ACD + \angle BAC &= 180^0\\ 60^0 + \angle BAC &= 180^0\\ \angle BAC &= 180^0 - 60^0\\ \angle BAC &= \boxed{120^0}\end{aligned}$$

Similarly, $AC \| BD$. Thus, $\angle ACD$ and $\angle CDB$ are consecutive interior angles.

Thus these two must be supplementary. That is,

$$\angle ACD + \angle CDB = 180^0$$
$$60^0 + \angle CDB = 180^0$$
$$\angle CDB = 180^0 - 60^0$$
$$\angle CDB = \boxed{120^0}$$

Similarly, $AB \parallel CD$ .Thus, $\angle ABD$ and $\angle CDB$ are consecutive interior angles. Thus these two must be supplementary. That is,

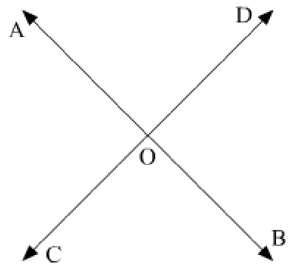
$$\angle ABD + \angle CDB = 180^0$$
$$\angle ABD + 120^0 = 180^0$$
$$\angle ABD = 180^0 - 120^0$$
$$\angle ABD = \boxed{60^0}$$

Hence the other angles are as follows:

$$\angle BAC = \boxed{120^0}$$
$$\angle CDB = \boxed{120^0}$$
$$\angle ABD = \boxed{60^0}$$

Lines and Angles Ex 8.4 Q19

Answer :



Since, lines AB and CD intersect each other at point O.

Thus, $\angle AOC$ and $\angle BOD$ are vertically opposite angles.

Therefore,

$\angle AOC = \angle BOD$ ...... (I)

Similarly,

$\angle COB = \angle AOD$ ...... (II)

Also, we have $\angle AOC$, $\angle BOD$, $\angle BOC$ and $\angle AOD$ forming a complete angle. Thus,

$$\angle AOC + \angle BOD + \angle COB + \angle AOD = 360^0$$

It is given that

$$\angle AOC + \angle COB + \angle BOD = 270^0$$

Thus, we get

$$(\angle AOC + \angle BOD + \angle COB) + \angle AOD = 360^0$$
$$270^0 + \angle AOD = 360^0$$
$$\angle AOD = 360^0 - 270^0$$
$$\angle AOD = \boxed{90^0}$$

From (II), we get:

$$\angle COB = \boxed{90^0}$$

We know that $\angle AOC$ and $\angle COB$ form a linear pair. Therefore, these must be supplementary.

$$\angle AOC + \angle COB = 180^0$$
$$\angle AOC + 90^0 = 180^0$$
$$\angle AOC = 180^0 - 90^0$$
$$\angle AOC = \boxed{90^0}$$

From (I), we get:

$$\angle BOD = \boxed{90^0}$$

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