

# Mathematics

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(Chapter – 6) (Lines and Angles)(Exemplar Problems)

(Class – IX)

## Exercise 6.3

### Question 1:

In Fig. 6.9, OD is the bisector of  $\angle AOC$ , OE is the bisector of  $\angle BOC$  and  $OD \perp OE$ . Show that the points A, O and B are collinear.

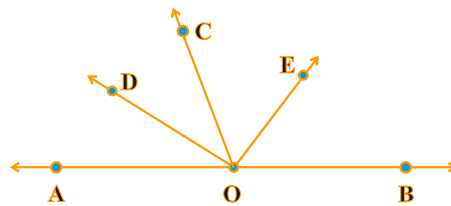


Fig. 6.9

### Answer 1:

Given:

In figure,  $OD \perp OE$ , OD and OE are the busectors of  $\angle AOC$  and  $\angle BOC$ .

To prove:

Points A, O and B are collinear i.e., AOB is a straight line.

Proof:

Since, OD and OE bisect angles  $\angle AOC$  and  $\angle BOC$  respectively.

$$\therefore \angle AOC = 2\angle DOC \quad \dots (i)$$

$$\text{and } \angle COB = 2\angle COE \quad \dots(ii)$$

On adding equations (i) and (ii), we get

$$\Rightarrow \angle AOC + \angle COB = 2\angle DOC + 2\angle COE$$

$$\Rightarrow \angle AOC + \angle COB = 2(\angle DOC + \angle COE)$$

$$\Rightarrow \angle AOC + \angle COB = 2\angle DOE$$

$$\Rightarrow \angle AOC + \angle COB = 2 \times 90^\circ \quad [ \because OD \perp OE ]$$

$$\Rightarrow \angle AOC + \angle COB = 180^\circ$$

$$\therefore \angle AOB = 180^\circ$$

So,  $\angle AOC + \angle COB$  are forming linear pair or AOB is a straight line.

Hence, points A, O and B are collinear.

