

# Mathematics

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

(Class – IX)

## Exercise 6.1

Write the correct answer in each of the following:

### Question 5:

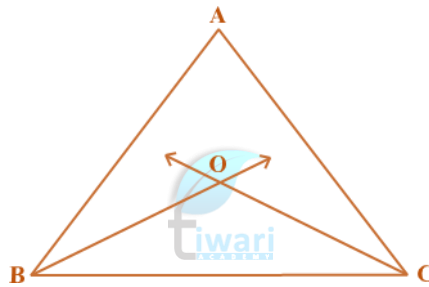
If one of the angles of a triangle is  $130^\circ$ , then the angle between the bisectors of the other two angles can be

- (A)  $50^\circ$                       (B)  $65^\circ$                       (C)  $145^\circ$                       (D)  $155^\circ$

### Answer 5:

- (D)  $155^\circ$

Solution:



Let the angles of  $\triangle ABC$  triangle be  $\angle A$ ,  $\angle B$  and  $\angle C$ .

In  $\triangle ABC$                        $\angle A + \angle B + \angle C = 180^\circ$   
[Sum of angles of a triangle is  $180^\circ$ ]

$\Rightarrow$                        $\frac{1}{2}\angle A + \frac{1}{2}\angle B + \frac{1}{2}\angle C = \frac{180^\circ}{2} = 90^\circ$   
[Dividing both sides by 2]

$\Rightarrow$                        $\frac{1}{2}\angle B + \frac{1}{2}\angle C = 90^\circ - \frac{1}{2}\angle A$

In  $\triangle OBC$ ,                       $\angle OBC + \angle BCO + \angle COB = 180^\circ$   
[Sum of angles of a triangle is  $180^\circ$ ]

$\Rightarrow$                        $\frac{\angle B}{2} + \frac{\angle C}{2} = 180^\circ - \angle BOC$



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[as BO and OC are the angle bisectors of  $\angle ABC$  and  $\angle BCA$  respectively]

$$\Rightarrow 180^\circ - \angle BOC = 90^\circ - \frac{1}{2}\angle A$$

$$\therefore \angle BOC = 180^\circ - 90^\circ + \frac{1}{2}\angle A = 90^\circ + \frac{1}{2}\angle A$$

$$= 90^\circ + \frac{1}{2} \times 130^\circ = 90^\circ + 65^\circ \quad [\angle A = 130^\circ]$$

$$= 155^\circ$$

Hence, the required angle is  $155^\circ$  and option (D) is correct.

