Question1

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Question 1. The angles of a triangle are in A.P. & $b : c = \sqrt{3} : \sqrt{2}$, then find $\angle A$.

(a) 60°

(b) $22\frac{1}{2}^\circ$

(c) 30°

(d) 75°

Solution: →

Using Sine Law:→

$$\frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\Rightarrow \quad \frac{\sin B}{\sin C} = \frac{b}{c} = \frac{\sqrt{3}}{\sqrt{2}} \qquad \text{——— (1)}$$

Since, the angles of the triangle are in A.P.

∴ Let the angles be

$$\angle A = A, \quad \angle B = A + d, \quad \angle C = A + 2d$$

Now, $\angle A + \angle B + \angle C = 180^\circ$

$$\Rightarrow \quad A + A + d + A + 2d = 180^\circ$$

$$\Rightarrow \quad A + d = 60^\circ \quad \text{—} \quad (2)$$

$\therefore$ From equation (1) :→

$$\frac{\sin B}{\sin C} = \frac{\sqrt{3}}{\sqrt{2}}$$

$$\Rightarrow \quad \frac{\sin(A+d)}{\sin C} = \sqrt{\frac{3}{2}}$$

$$\Rightarrow \quad \frac{\sin(60^\circ)}{\sin C} = \sqrt{\frac{3}{2}}$$

$$\Rightarrow \quad \sin C = \sqrt{\frac{2}{3}} \times \frac{\sqrt{3}}{2} = \frac{1}{\sqrt{2}}$$

$$\Rightarrow \quad \angle C = 45^\circ$$

$\therefore \quad A + 2d = 45^\circ \quad \text{——} \quad (3)$

Solving equation (2) and (3), we get

$$A = 75^\circ \text{ and } d = -15^\circ$$

$\therefore A - 15^\circ$

$\therefore \angle A = A = 75^\circ$ Ans. (option d)