

(الف)

$$\tan \theta + \sin \theta \times \cos \theta$$

$$-1 + \left(\frac{-\sqrt{2}}{2} \times \frac{-\sqrt{2}}{2} \right) = \frac{2}{2} = 1 \checkmark$$

(ب)

$$\tan \theta \times \sin \theta + \cos \theta$$

$$\left(-\frac{1}{\sqrt{2}} \times -\frac{\sqrt{2}}{2} \right) + \left(-\frac{1}{2} \right) = \frac{1}{2} - \frac{1}{2} = 0$$

$\cot \theta = 2 \rightarrow \cos \theta = 2 \sin \theta$

$$\frac{2(2 \sin \theta) - \sin \theta}{2 \sin \theta + 3 \sin \theta} = \frac{11 \sin \theta}{5 \sin \theta} = \frac{11}{5} \checkmark$$

$\tan \theta = 2 \rightarrow \sin \theta = 2 \cos \theta$ $\sin^2 \theta + \cos^2 \theta = 1$ و

$$\tan^2 \theta + 1 = \frac{1}{\cos^2 \theta} \Rightarrow 8 = \frac{1}{\cos^2 \theta} = \cos^2 \theta = \frac{1}{8} \rightarrow \cos \theta = \frac{1}{\sqrt{8}}$$

در نامه سوالات پس $\cos \theta = \frac{-1}{\sqrt{8}}$

(الف)

$$\cos \theta \cos \theta - \sin \theta \sin \theta \rightarrow 0.17 - 0.1 = 0.07 \checkmark$$

(ب)

$$\sin \theta \cos \theta + \cos \theta \sin \theta \rightarrow 0.17 + 0.1 = 0.27 \checkmark$$

$\sin^2 \theta + \cos^2 \theta = 1$ پس $\sin^2 \theta = \frac{1}{4}$ و $\cos^2 \theta = \frac{3}{4}$ $\tan^2 \theta + 1 = \frac{1}{\cos^2 \theta}$

$\rightarrow \tan^2 \theta + 1 = \frac{4}{3} \rightarrow \tan^2 \theta = \frac{1}{3} \checkmark$

$$s = \frac{1}{r} abc \cos a \rightarrow \textcircled{1} \frac{1}{r} \times 4 \times \sqrt{4} \times \cos a$$

$$4 = \sqrt{r^2} + \sqrt{r^2}$$

$$\textcircled{2} \frac{1}{r} \times \sqrt{r} \times \sqrt{r} \times \cos a$$

$$\textcircled{3} \frac{1}{r} \times r \times \sqrt{r} \times \cos a$$

$\textcircled{2} < \textcircled{1} < \textcircled{3}$
 ↓
 کمترین
 بیشترین

$$a : b = r : r$$

$$s = ab \sin \theta$$

$$\sin 18^\circ = \sin(18^\circ - 18^\circ) = \sin r \cdot \frac{1}{r}$$

$$a = rk \quad b = rk$$

$$s = rk \times rk \times \frac{1}{r} = rk^2 \times \frac{1}{r} = rk^2 \quad A = rk^2 \Rightarrow k^2 = \frac{A}{r} \Rightarrow k = \sqrt{\frac{A}{r}}$$

$$r = \sqrt{\frac{A}{k^2}} \quad D = r(a+b) = r(rk + rk) = r \times 2rk = 1 \quad \therefore r = \frac{1}{2} \sqrt{\frac{A}{k^2}}$$

$$k = \sqrt{\frac{r}{A}} = \sqrt{\frac{1}{4}} = \frac{1}{2} \quad D = r(a+b) = r(1+1) = r \times 2 = 1 \quad \therefore r = \frac{1}{2}$$

$$\triangle ABC \sim \triangle ADE = 1/4 \Rightarrow \left(\frac{1}{4} \times 1 \times 1 \times \sin a \right) - \left(\frac{1}{4} \times r \times r \times \sin a \right) =$$

$$\frac{1}{4} \Rightarrow \frac{\sin}{r} (1 \times 1 - r \times r) = 1/4 \Rightarrow \sin = \frac{1}{r} = \frac{1}{2}$$

$$\alpha = 30^\circ \Rightarrow \cos \alpha = \frac{\sqrt{3}}{2}$$

$$\tan \alpha = \frac{\sin}{\cos} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} \checkmark$$

$$\triangle BNC \sim \triangle NMC \Rightarrow BN = \frac{r}{r} NC \Rightarrow 1 = \frac{r}{r} \times \frac{r}{r} \rightarrow$$

$$\triangle ABC = r(\triangle BNM) \Rightarrow \frac{1}{r} \times \triangle ABC \times \sin B = r \left(\frac{1}{r} \times \triangle BNM \times \sin B \right)$$

$$\Rightarrow AB \times \delta = r(BN \times \frac{r}{r}) \Rightarrow AB = BN + AN = \frac{9}{8} BN \Rightarrow$$

$$\frac{BN + AN}{BN} = \frac{9}{8} \Rightarrow \frac{BN}{BN} + \frac{AN}{BN} = \frac{9}{8} \Rightarrow \frac{AN}{BN} = \frac{1}{8} \Rightarrow \frac{AN}{BN} = \frac{1}{8}$$

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