

$\sin a \cos b + \cos a \sin b$
 $\frac{1}{2} \times \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} \times \frac{1}{2}$
 Date:

$\frac{3}{4} - \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$
 در صورتی که B

Subject:

1980

الف) $-1 + (-\frac{\sqrt{3}}{2}) \times (-\frac{\sqrt{3}}{2}) = \frac{-1}{2}$ ✓
 ب) $(-\frac{\sqrt{3}}{2}) \times (-\frac{\sqrt{3}}{2}) + \frac{-1}{2}$ ✓

2

$1 + \cot^2 \alpha = \frac{1}{\sin^2 \alpha}$ $\Rightarrow \frac{1}{\sin^2 \alpha} = 1 + 14 = 15 \Rightarrow \sin^2 \alpha = \frac{1}{15} \Rightarrow \sin \alpha = \frac{1}{\sqrt{15}}$

$\Rightarrow \cos^2 \alpha = \frac{14}{15} \Rightarrow \cos \alpha = \frac{\sqrt{14}}{\sqrt{15}}$ $\Rightarrow \frac{12}{\sqrt{15}} - \frac{1}{\sqrt{15}} = \frac{11}{\sqrt{15}}$ ✓

2

$\sin^2 \alpha + \cos^2 \alpha = 1$ $\Rightarrow \cos^2 \alpha + \cos^2 \alpha = 1 \Rightarrow \cos^2 \alpha = \frac{1}{2} \Rightarrow \cos \alpha = \frac{1}{\sqrt{2}}$ ✓
 $\Rightarrow \sin^2 \alpha = \frac{1}{2}$

2

$\cos(\frac{11\pi}{10} + \alpha) = \cos \alpha \cos \frac{11\pi}{10} - \sin \alpha \sin \frac{11\pi}{10}$
 $(\frac{\sqrt{3}}{10} \times \frac{\sqrt{3}}{2}) - (\frac{\sqrt{3}}{10} \times \frac{\sqrt{3}}{2}) = \frac{3}{20} - \frac{3}{20} = \frac{12}{20} - \frac{4}{20} = \frac{8}{20} = \frac{2}{5}$ ✓

$\frac{1}{5} \left(\frac{1}{5} \right)$

2

$\cot(\frac{5\pi}{6} + \alpha) = \frac{\cos(\frac{5\pi}{6} + \alpha)}{\sin(\frac{5\pi}{6} + \alpha)}$
 $\frac{\cos(\frac{5\pi}{6} + \alpha)}{\sin(\frac{5\pi}{6} + \alpha)} = \frac{\cos \alpha \cos \frac{5\pi}{6} - \sin \alpha \sin \frac{5\pi}{6}}{\sin \alpha \cos \frac{5\pi}{6} + \cos \alpha \sin \frac{5\pi}{6}}$
 $\frac{(-\frac{\sqrt{3}}{2} \times \frac{1}{2}) + (-\frac{1}{2} \times \frac{\sqrt{3}}{2})}{(\frac{1}{2} \times \frac{\sqrt{3}}{2}) + (\frac{\sqrt{3}}{2} \times \frac{1}{2})} = \frac{-\frac{\sqrt{3}}{4} - \frac{\sqrt{3}}{4}}{\frac{\sqrt{3}}{4} + \frac{\sqrt{3}}{4}} = \frac{-\frac{\sqrt{3}}{2}}{\frac{\sqrt{3}}{2}} = -1$ ✓

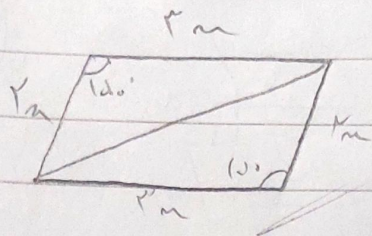
$\Rightarrow \frac{-\sqrt{3}}{2} + \frac{-1}{2} = \frac{-\sqrt{3}-1}{2}$ ✓

$\sin^2 \alpha + (\sin^2 \alpha + \cos^2 \alpha) = \frac{5}{4} \Rightarrow \sin^2 \alpha = \frac{1}{4} \Rightarrow \sin \alpha = \frac{1}{2}$ ✓
 $\Rightarrow \cos^2 \alpha = \frac{3}{4} \Rightarrow \cos \alpha = \frac{\sqrt{3}}{2}$ ✓

$$S_{ABC} = \frac{1}{2} \times \cancel{4} \times \sqrt{3} \times \sin A = \frac{F}{\omega} \times \sin A = \frac{F/\omega}{\sqrt{3}} = \frac{1/\omega}{\sqrt{3}} = \frac{\sqrt{3}}{9} \quad (4)$$

$$\therefore \sin A = \frac{\sqrt{3}}{9} \Rightarrow A \begin{cases} 9^\circ \\ 11^\circ \end{cases} \Rightarrow \frac{11^\circ}{9^\circ} \Rightarrow \boxed{\frac{11}{9}} \quad \checkmark$$

(4)



$$S_{\Delta} = \frac{1}{2} \times 10 \times 4 = \frac{1}{2} \times 40 = 20 \text{ m}^2$$

$\therefore 10 \text{ m} \times 4 \text{ m} = 40 \text{ m}^2$

$\therefore P = 10 \text{ m} = 90$

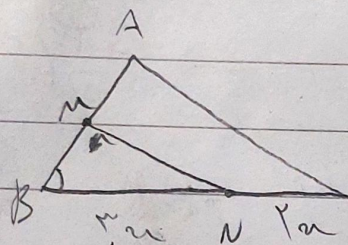
(10)

$$S_{ABC} = \frac{1}{2} \times \omega \times V \times \sin A = \frac{\omega}{2} \sin A$$

$$S_{ADE} = \frac{1}{2} \times \cancel{4} \times V \times \sin A = 1 \times \sin A$$

$$\therefore \sin A = \frac{1}{\sqrt{3}} \Rightarrow \tan A = \frac{1}{\sqrt{3}} \Rightarrow \frac{\sqrt{3}}{3} \quad \checkmark$$

(4)



$$MBN, MNC, \frac{BN}{NC} = \frac{9}{9}$$

(9)

$$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} \times \omega \times AB \times \sin B}{\frac{1}{2} \times 9 \times BM \times \sin B} = \frac{\omega \times AB}{9 \times BM} = \frac{9}{1}$$

(9)

$$\therefore \frac{AB}{BM} = \frac{9}{\omega} \Rightarrow \frac{AM+BM}{BM} = \frac{9}{\omega} \Rightarrow \frac{AM}{BM} + 1 = \frac{9}{\omega} \Rightarrow \frac{AM}{BM} = \frac{9}{\omega} - 1 = \frac{9}{\omega} - \frac{\omega}{\omega} = \frac{9-\omega}{\omega} = \frac{9-9}{9} = 0$$

$$\frac{-1}{\cot A} = -\tan A \Rightarrow \tan A = -\cot A$$

(0)

$$\frac{1}{\cos A} = \sec A = \frac{1+\sin A}{\cos A} \Rightarrow \frac{\sin A}{\cos A} = \frac{1+\sin A}{\cos A} - \frac{1}{\cos A} = \sec A - \frac{1}{\cos A}$$

سوال ۱۷

$$S = 2 \left(r_1 \times r_2 \times \frac{1}{r} \times \sin \frac{\alpha}{2} \right) = 2 \times 2 \times 2 \times \frac{1}{2} \times \frac{1}{2} = 2 = \omega^2 \rightarrow \alpha = 2\sqrt{2}$$

$$P (\text{محيط}) = (r_1 + r_2) \times 2 = 10 \times 2 = 10 \times (2\sqrt{2}) = 20\sqrt{2}$$



سوال ۱۰

$$\frac{1}{\sqrt{\cos 2\alpha}} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{|\cos \alpha|} \rightarrow \frac{1}{|\cos \alpha|} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{|\cos \alpha|} \rightarrow$$

$$\frac{1}{|\cos \alpha|} - \frac{1 + \sin \alpha}{|\cos \alpha|} = \frac{\sin \alpha}{\cos \alpha} \rightarrow \frac{-\sin \alpha}{|\cos \alpha|} = \frac{\sin \alpha}{\cos \alpha} \rightarrow \cos \alpha < 0 \quad (I)$$

$$\frac{|\sin \alpha|}{\cos \alpha} = -\frac{1}{\cot \alpha} = -\frac{\sin \alpha}{\cos \alpha} \rightarrow |\sin \alpha| = -\sin \alpha \rightarrow \sin \alpha < 0 \quad (II)$$

(I), (II) $\rightarrow$ نه مثبت