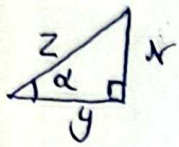


الف) $\tan \frac{11\pi}{4} + \sin \frac{10\pi}{4} \times \cos \frac{13\pi}{4} = \tan \frac{3\pi}{4} + \sin \frac{5\pi}{4} \times \cos \frac{7\pi}{4}$
 $= -1 + \frac{-\sqrt{2}}{2} \times \frac{-\sqrt{2}}{2} = -1 + \frac{1}{2} = -\frac{1}{2}$

ب) $\tan \frac{13\pi}{4} \cdot \sin \frac{11\pi}{4} + \cos \frac{10\pi}{4} = \tan \frac{5\pi}{4} \cdot \sin \frac{3\pi}{4} + \cos \frac{5\pi}{4} = \frac{1}{\sqrt{2}} \times \frac{-\sqrt{2}}{2} + \frac{-1}{2} = -\frac{1}{2} - \frac{1}{2} = -1$

$$\frac{3 \cos x - \sin x \times \frac{1}{\sin x}}{\cos x + \sin x \times \frac{1}{\sin x}} = \frac{3 \cot x - 1}{\cot x + 1} = \frac{12 - 1}{4 + 1} = \frac{11}{5}$$



$\sin \alpha = \frac{z}{\sqrt{y^2 + z^2}} \Rightarrow \frac{z}{\sqrt{y^2 + z^2}} = \frac{y}{\sqrt{y^2 + z^2}} \Rightarrow x = \frac{y}{z} \Rightarrow x^2 + y^2 = z^2 \Rightarrow \omega y^2 = z^2 \Rightarrow z = y \sqrt{\omega} / \cos \alpha = \frac{y}{\frac{1}{\sqrt{\omega}}} = \frac{\sqrt{\omega}}{\omega}$

الف)

$1 - \sin^2 \alpha = \cos^2 \alpha \Rightarrow 1 - \frac{9}{100} = \frac{91}{100} \Rightarrow \cos \alpha = \frac{\sqrt{91}}{10}$
 $\cos(\frac{11\pi}{4} + \alpha) = \cos(\frac{3\pi}{4} + \alpha) = \cos \frac{3\pi}{4} \cos \alpha - \sin \frac{3\pi}{4} \sin \alpha = (\frac{-\sqrt{2}}{2})(\frac{\sqrt{91}}{10}) - (\frac{\sqrt{2}}{2})(\frac{3}{10})$
 $= -\frac{3\sqrt{2}}{20}$

ب)

$\tan^2 \alpha + 1 = \frac{1}{\cos^2 \alpha} \Rightarrow \frac{1}{\cos^2 \alpha} = \frac{49}{9} \Rightarrow \cos \alpha = \frac{3}{7} / \sin^2 \alpha = 1 - \cos^2 \alpha \Rightarrow \sin \alpha = \frac{4}{7}$
 $\sin(\frac{13\pi}{4} + \alpha) = \sin(\frac{5\pi}{4} + \alpha) = \sin \frac{5\pi}{4} \cos \alpha + \cos \frac{5\pi}{4} \sin \alpha = (\frac{-\sqrt{2}}{2})(\frac{3}{7}) + (\frac{-\sqrt{2}}{2})(\frac{4}{7})$
 $= -\frac{7\sqrt{2}}{14} = -\frac{\sqrt{2}}{2}$

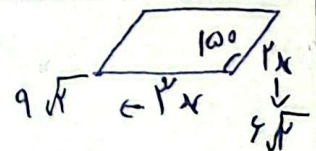
$\left. \begin{aligned} 3 \sin^2 x + \cos^2 x &= \frac{4}{5} \\ \sin^2 x + \cos^2 x &= 1 \end{aligned} \right\} \Rightarrow \sin^2 x = \frac{1}{5} / \frac{1}{5} + \cos^2 x = 1 \Rightarrow \cos^2 x = \frac{4}{5} / \tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{5}}{\frac{4}{5}} = \frac{1}{4}$

$S = \frac{1}{2} \times 9 \times \sqrt{3} \times \sin \alpha = \frac{9\omega}{10} \Rightarrow \sin \alpha = \frac{\sqrt{3}}{10} \left. \begin{aligned} \alpha < 180^\circ \\ \alpha > 40^\circ \end{aligned} \right\} \Rightarrow \alpha = 140^\circ$

$$\frac{140}{40} = \boxed{4}$$

$S_{\text{کلی}} = 3x \times 3x \times \sin 100 = 9\omega \Rightarrow 9x^2 \times \frac{1}{2} = 9\omega \Rightarrow x^2 = 1 \Rightarrow x = \sqrt{2}$

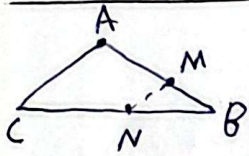
مساحت = $9\sqrt{2} + 9\sqrt{2} + 9\sqrt{2} + 9\sqrt{2} = 36\sqrt{2}$



$$\frac{1}{r} \times v \times \omega \times \sin A = \frac{1}{r} \times r \times v + 1, v \omega \Rightarrow \sin A \times \frac{r \omega}{r} = \sin A \times r + 1, v \omega \Rightarrow \sin A = \frac{r \omega}{r \omega + 1}$$

$$\cos^2 A + \sin^2 A = 1 \Rightarrow \cos^2 A = \frac{r \omega}{r \omega + 1} \Rightarrow \tan A = \frac{\frac{r \omega}{r \omega + 1}}{\frac{r \omega}{r \omega + 1}} = \frac{1}{r \omega}$$

1



$$r BN = r NC \Rightarrow BN = \frac{r}{\omega} BC$$

$$\frac{1}{r} \times \sin B \times AB \times BC = r \times \frac{1}{r} \times \sin B \times BM \times BN$$

$$\Rightarrow \frac{1}{r} \times \sin B \times AB \times BC = r \times \frac{1}{r} \times BM \times \frac{r}{\omega} BC \Rightarrow \frac{r}{\omega} BM = AB \Rightarrow BM = \frac{\omega}{r} AB$$

$$BM + AM = AB \Rightarrow AM = \frac{r}{\omega} AB \Rightarrow \frac{BM}{AM} = \frac{\omega}{r}$$

9

$$\frac{1}{\cos^2 \alpha} - \tan \alpha = \frac{1 + \sin \alpha}{|\cos \alpha|} \Rightarrow \frac{1}{|\cos \alpha|} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{|\cos \alpha|} \quad \begin{matrix} \cos \alpha > 0 \Rightarrow \frac{1 - \sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{\cos \alpha} \times \\ \cos \alpha < 0 \Rightarrow \frac{-1 - \sin \alpha}{\cos \alpha} = \frac{-1 - \sin \alpha}{\cos \alpha} \checkmark \end{matrix}$$

10

$$\frac{|\sin \alpha|}{\cos \alpha} = \frac{-1}{\cot \alpha} \Rightarrow \frac{|\sin \alpha|}{\cos \alpha} = \frac{-\sin \alpha}{\cos \alpha} \Rightarrow \sin \alpha < 0$$

$$\sin \alpha < 0 \rightarrow \text{پس منفی}$$

$$\cos \alpha < 0$$