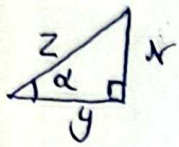


الف) $\tan \frac{11\pi}{4} + \sin \frac{10\pi}{4} \times \cos \frac{13\pi}{4} = \tan \frac{3\pi}{4} + \sin \frac{5\pi}{4} \times \cos \frac{7\pi}{4}$
 $= -1 + \frac{-\sqrt{2}}{2} \times \frac{-\sqrt{2}}{2} = -1 + \frac{1}{2} = -\frac{1}{2}$

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

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



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

الف)

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

ب)

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

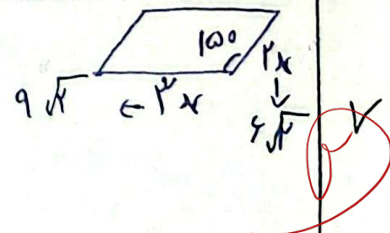
$\left. \begin{aligned} 3\sin^2 x + \cos^2 x &= \frac{4}{5} \\ \sin^2 x + \cos^2 x &= 1 \end{aligned} \right\} \Rightarrow \sin^2 x = \frac{1}{5} / \frac{1}{5} + \cos^2 x = 1 \Rightarrow \cos^2 x = \frac{4}{5} / \tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{5}}{\frac{4}{5}} = \frac{1}{4}$

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

$\frac{120}{40} = \boxed{3}$

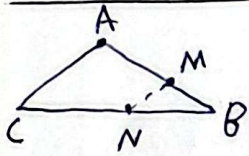
$S_{\text{کل}} = 3x \times 3x \times \sin 100^\circ = \omega \Rightarrow 9x^2 \times \frac{1}{2} = \omega \Rightarrow x^2 = \frac{\omega}{9} \Rightarrow x = \frac{\sqrt{\omega}}{3}$

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



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

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



$$rBN = rNC \Rightarrow BN = \frac{r}{\omega} BC$$

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

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

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

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

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

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

$$\cos \alpha < 0$$