

$$\text{الف) } \tan\left(3\pi - \frac{\pi}{6}\right) + \sin\left(4\pi - \frac{\pi}{6}\right) \cos\left(3\pi + \frac{\pi}{6}\right) \rightarrow$$

$$-\tan\left(\frac{\pi}{6}\right) + (-\sin\frac{\pi}{6}) \times -\cos\left(\frac{\pi}{6}\right) = -1 + \frac{1}{2} = -\frac{1}{2}$$

$$\text{ب) } \tan\left(3\pi - \frac{\pi}{6}\right) \times \sin\left(4\pi - \frac{\pi}{6}\right) + \cos\left(3\pi + \frac{\pi}{6}\right) \rightarrow \left(-\tan\left(\frac{\pi}{6}\right) \times -\sin\left(\frac{\pi}{6}\right)\right) - \cos\left(\frac{\pi}{6}\right)$$

$$\frac{1}{2} - \frac{1}{2} = 0$$

$$\frac{3 \cot \alpha - 1}{\cot \alpha + 1} = \frac{3(1) - 1}{1 + 1} = \frac{11}{2}$$

(۲) $\sin \alpha$ و $\cos \alpha$ کے قیاس میں

$$\sin^2 \alpha + \cos^2 \alpha = 1 \rightarrow (1 \cos \alpha)^2 + \cos^2 \alpha = 1 \rightarrow 1 \cos^2 \alpha + \cos^2 \alpha = 1$$

$$2 \cos^2 \alpha = 1 \rightarrow \cos^2 \alpha = \frac{1}{2} \rightarrow \cos \alpha = \pm \frac{\sqrt{2}}{2}$$

$$\cos \alpha = \frac{\sqrt{2}}{2}$$

$$\text{الف) } \cos\left(2\pi + \frac{\pi}{6} + \alpha\right) = \cos\left(\frac{\pi}{6} + \alpha\right) \rightarrow \cos\frac{\pi}{6} \cos \alpha - \sin\frac{\pi}{6} \sin \alpha =$$

$$\cos \alpha = -\sqrt{1 - \sin^2 \alpha} \rightarrow \cos \alpha = -\sqrt{1 - \frac{1}{4}} = -\frac{\sqrt{3}}{2}$$

$$\frac{\sqrt{3}}{2} - \frac{1}{2} = \frac{\sqrt{3}-1}{2}$$

$$\text{ب) } \sin\left(2\pi + \frac{\pi}{6} + \alpha\right) = \sin\left(\frac{\pi}{6} + \alpha\right) \rightarrow \sin\frac{\pi}{6} \cos \alpha + \cos\frac{\pi}{6} \sin \alpha$$

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

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

$$\sin^2 \alpha = 1 - \cos^2 \alpha$$

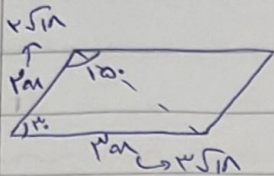
$$2(1 - \cos^2 \alpha) + \cos^2 \alpha = \frac{1}{2} \rightarrow \cos^2 \alpha = \frac{3}{2}$$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \rightarrow 1 + \tan^2 \alpha = \frac{2}{3} \rightarrow \tan^2 \alpha = -\frac{1}{3}$$

$$\sin \alpha = \frac{1}{2} \times 4 \times \sqrt{3} \times \sin \alpha = 2\sqrt{3} \rightarrow \sin \alpha = \frac{2\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$$

$$\sin \alpha = \frac{\sqrt{3}}{2} \rightarrow \alpha = 60^\circ \text{ or } 120^\circ$$

$$\frac{120}{60} = 2$$



$$\left(\frac{1}{r} \times r \sin \theta \times r \sin \theta \times \sin \theta \right) \times r = \omega r \quad \text{and} \quad r \sin \theta \times \frac{1}{r} = \omega r$$

$$r \sin \theta = \omega r \rightarrow \sin \theta = \omega \rightarrow \theta = \sin^{-1} \omega$$

$$P = (r \sin \theta + r \sin \theta) \times r = 10 \sqrt{11}$$

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

$$\frac{\omega V}{r} \sin A$$

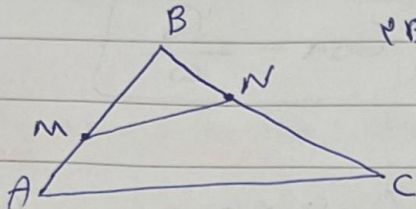
$$S_{ADE} = \frac{1}{r} \times V \times r \times \sin A$$

$$V \sin A$$

$$V \omega \sin A - V \sin A = V \omega \rightarrow \omega \sin A = 1, V \omega \rightarrow \sin A = \omega = \frac{1}{r} \quad \text{Since } \omega = \frac{1}{r}$$

$$\tan A = \frac{1}{\sqrt{r}} = \frac{\sqrt{r}}{r}$$

$$A = 30^\circ$$



$$r_{BN} = r_{NC} \rightarrow BN = \frac{r}{r} NC$$

$$\frac{r}{r} NC + NC = \omega NC$$

$$S_{ABC} = \frac{1}{r} \times \frac{\omega}{r} NC \times AB \times \sin B = r \times \left(\frac{1}{r} \times \frac{r}{r} NC \times MB \times \sin B \right)$$

$$\frac{\omega}{r} NC \times AB \times \sin B = \frac{r}{r} NC \times MB \times \sin B$$

$$(BM + AM)$$

$$\frac{\omega}{r} BM + \frac{\omega}{r} AM = \frac{r}{r} MB \rightarrow \frac{\omega}{r} AM = MB$$

$$\frac{BM}{AM} = \frac{\omega}{r}$$

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

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

$$\begin{aligned} \cos > 0 &\rightarrow \tan \alpha = -\tan \alpha \\ \cos < 0 &\rightarrow \tan \alpha = \tan \alpha \end{aligned}$$

$$\cos \alpha < 0, \sin \alpha < 0 \rightarrow \text{third quadrant}$$

