

$$\text{الف) } \tan \frac{11\pi}{4} + \sin \frac{10\pi}{4} \times \cos \frac{1\pi}{4}$$

$$\frac{11\pi}{4} = \frac{\pi}{4} \rightarrow \alpha = 290^\circ \rightarrow 360^\circ - 70^\circ = 290^\circ \rightarrow \tan 290^\circ = -1$$

$$\frac{10\pi}{4} = \frac{5\pi}{2} \rightarrow \alpha = 270^\circ \rightarrow 360^\circ - 90^\circ = 270^\circ \rightarrow \sin 270^\circ = -\sqrt{2}$$

$$\frac{1\pi}{4} = \frac{\pi}{4} \rightarrow \alpha = 45^\circ \rightarrow 45^\circ - 360^\circ = 315^\circ \rightarrow \cos 315^\circ = \frac{\sqrt{2}}{2}$$

$$\rightarrow -1 + \frac{-\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = -1 + \frac{-2}{4} = -1 - \frac{1}{2} = -\frac{3}{2}$$

$$\text{ب) } \tan \frac{14\pi}{9} \sin \frac{11\pi}{4} + \cos \frac{10\pi}{9}$$

$$\frac{14\pi}{9} = \frac{2\pi}{9} \rightarrow \alpha = 40^\circ \rightarrow 40^\circ - 360^\circ = 320^\circ \rightarrow \tan 320^\circ = -\frac{\sqrt{2}}{2}$$

$$\frac{11\pi}{4} = \frac{5\pi}{2} \rightarrow \alpha = 270^\circ \rightarrow 360^\circ - 90^\circ = 270^\circ \rightarrow \sin 270^\circ = -\sqrt{2}$$

$$\frac{10\pi}{9} = \frac{2\pi}{9} \rightarrow \alpha = 40^\circ \rightarrow 40^\circ - 360^\circ = 320^\circ \rightarrow \cos 320^\circ = \frac{1}{2}$$

$$\rightarrow \frac{-\sqrt{2}}{2} \times \frac{-\sqrt{2}}{2} - \frac{1}{2} = \frac{2}{4} - \frac{1}{2} = 0$$

$$\frac{\cos x}{\sin x} = k \rightarrow \cos x = k \sin x$$

$$\frac{3k \sin x - \sin x}{k \sin x + \sin x} = \frac{11}{5}$$

$$\sin^2 x + \cos^2 x = 1 \rightarrow k^2 \cos^2 x + \cos^2 x = 1 \rightarrow \Delta \cos^2 x = 1 \rightarrow \cos^2 x = \frac{1}{\Delta}$$

$$\cos x = \pm \frac{1}{\sqrt{\Delta}} \rightarrow \text{مقدار قابل قبول زیرا در ربع سوم است} \quad \cos x = -\frac{1}{\sqrt{\Delta}}$$

$$\text{الف) } \sin^2 x + \cos^2 x = 1 \rightarrow \frac{1}{10} + \cos^2 x = 1 \rightarrow \cos^2 x = \frac{9}{10} \rightarrow \cos x = \pm \frac{3\sqrt{10}}{10}$$

$$\frac{11\pi}{4} = 2\pi + \frac{3\pi}{4} \rightarrow \sin \frac{11\pi}{4} = \frac{\sqrt{2}}{2} \quad \cos \frac{11\pi}{4} = \frac{\sqrt{2}}{2}$$

$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$

$$\frac{11\pi}{4} \times \left(-\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} - \left(\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} \right) \right) = \frac{1k}{2} - \frac{2}{2} = \frac{1k}{2} - 1 = \frac{1k}{2} - \frac{2}{2}$$

$$\text{ب) } 1 + \tan^2 x = \frac{1}{\cos^2 x} \rightarrow 1 + \frac{1}{k^2} = \frac{1}{\cos^2 x} = \frac{10}{9} \rightarrow \cos^2 x = \frac{9}{10} \rightarrow \cos x = \pm \frac{3\sqrt{10}}{10}$$

$$\frac{13\pi}{4} = 2\pi + \frac{5\pi}{4} \rightarrow \sin \frac{13\pi}{4} = -\frac{\sqrt{2}}{2} \quad \cos \frac{13\pi}{4} = -\frac{\sqrt{2}}{2}$$

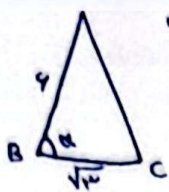
$$\sin \left(\frac{13\pi}{4} + x \right) = \sin \frac{13\pi}{4} \cos x + \cos \frac{13\pi}{4} \sin x = \left(-\frac{\sqrt{2}}{2} \times \frac{1}{\sqrt{10}} \right) - \left(-\frac{\sqrt{2}}{2} \times \frac{3\sqrt{10}}{10} \right) = \frac{-\sqrt{2}}{2\sqrt{10}} + \frac{3\sqrt{2}}{2\sqrt{10}}$$

$$\begin{cases} \sin^2 x + \cos^2 x = \frac{9}{10} \\ (\sin^2 x + \cos^2 x = 1) \times -1 \end{cases} \rightarrow \frac{9}{10} + \cos^2 x = 1 \rightarrow \cos^2 x = \frac{1}{10} \rightarrow \cos x = \pm \frac{1}{\sqrt{10}}$$

$$\sin^2 x = \frac{9}{10} \quad \sin x = \pm \frac{3}{\sqrt{10}}$$

$$\tan^2 x = \left(\frac{\frac{3}{\sqrt{10}}}{\frac{1}{\sqrt{10}}} \right)^2 = \left(\frac{3}{1} \right)^2 = 9$$

$$\sin \left(\frac{13\pi}{4} + x \right) = \sin \left(2\pi + \frac{5\pi}{4} + x \right) = \sin \left(\frac{5\pi}{4} + x \right) = -\sin \left(\frac{\pi}{4} + x \right) = -\left(\sin \frac{\pi}{4} \cos x + \cos \frac{\pi}{4} \sin x \right) = -\left(\frac{\sqrt{2}}{2} \times \frac{1}{\sqrt{10}} + \frac{\sqrt{2}}{2} \times \frac{3\sqrt{10}}{10} \right) = -\frac{\sqrt{2}}{2\sqrt{10}} - \frac{3\sqrt{2}}{2\sqrt{10}} = -\frac{4\sqrt{2}}{2\sqrt{10}} = -\frac{2\sqrt{2}}{\sqrt{10}} = -\frac{2\sqrt{20}}{10} = -\frac{4\sqrt{5}}{10} = -\frac{2\sqrt{5}}{5}$$



$$S = \frac{1}{2} \times AB \times BC \times \sin \alpha$$

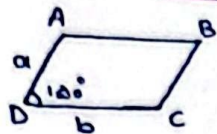
$$\frac{\frac{1}{2} \times \sqrt{r} \times \sin \alpha}{\frac{1}{2}} = r \times \frac{1}{r} \rightarrow \sin \alpha = \frac{\sqrt{r}}{r}$$

$$\max \alpha = 110^\circ$$

$$\min \alpha = 90^\circ$$

$$1/r = r \times \frac{1}{r}$$

$$\downarrow$$



$$S = ab \times \sin 150^\circ = \Delta F \rightarrow ab = 10\lambda$$

$$\rightarrow \frac{1}{r} \times a \times a = \frac{1}{r} a^2 = 10\lambda \rightarrow$$

$$\frac{a}{b} = \frac{r}{r} \rightarrow r b = r a \rightarrow b = \frac{r}{r} a$$

$$a^2 = 10\lambda \times \frac{r}{r} \rightarrow a = \sqrt{10\lambda r}$$

$$b = \frac{r}{r} \sqrt{10\lambda r}$$

$$\underline{\cos} = \sqrt{10\lambda r} + \sqrt{10\lambda r} = \Delta \sqrt{10\lambda r} \quad \omega \times 4 \sqrt{r} = r \sqrt{r}$$

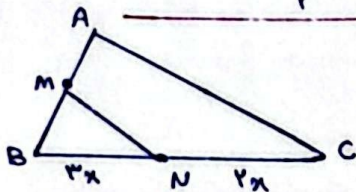
$$S_{ABC} - S_{ADE} = 1/r \Delta$$

$$V \times \Delta \times \frac{1}{r} \times \sin \alpha - V \times r \times \frac{1}{r} \times \sin \alpha = 1/r \Delta$$

$$\frac{r \Delta}{r} \times \sin \alpha - 1/r \times \sin \alpha = 1/r \Delta$$

$$\rightarrow r \Delta \sin \alpha = 1/r \Delta \rightarrow \sin \alpha = \frac{1}{r} \rightarrow \alpha = 30^\circ$$

$$\tan 30^\circ = \frac{1/r}{\sqrt{r}} = \frac{\sqrt{r}}{r}$$



$$\frac{S_{BMN}}{S_{ABC}} = \frac{BM \times BN}{BA \times BC} = \frac{BM}{BA} \times \frac{1}{r} = \frac{1}{r}$$

$$\rightarrow \frac{BM}{BA} = \frac{r}{r} \rightarrow \frac{BM}{AM} = \frac{r}{r} = 1/r \Delta$$

$$\frac{1}{\pm \cos \alpha} - \tan \alpha = \frac{1 + \sin \alpha}{\pm \cos \alpha}$$

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

$$\rightarrow \frac{1}{-\cos \alpha} + \frac{\sin \alpha}{-\cos \alpha}$$

$$\frac{\sin \alpha}{\cos \alpha} = -\frac{\sin}{\cos \alpha}$$

→ در صورتی که در سمت چپ را
- Sin α و در سمت راست را

$$\rightarrow \sin \alpha < 0, \cos \alpha < 0$$