

19, a

کلیف B

$$\cot \alpha = \frac{\cos \alpha}{\sin \alpha} = \frac{1}{\sqrt{\frac{1-\cos \alpha}{1+\cos \alpha}}} \Rightarrow \frac{1}{\sqrt{\cos \alpha}} - \frac{1}{\cot \alpha} = \frac{1-\sin \alpha}{|\cos \alpha|} \quad (1)$$

$$\frac{1}{|\cos \alpha|} - \tan \alpha = \frac{1}{|\cos \alpha|} - \frac{\sin \alpha}{|\cos \alpha|} \Rightarrow \tan \alpha = \frac{\sin \alpha}{|\cos \alpha|} \Rightarrow \cos \alpha > 0 \quad (2)$$

$$\cot \alpha = \frac{\cos \alpha}{|\sin \alpha|} \Rightarrow \sin \alpha > 0 \quad (3) \quad \text{در نامه اول } (II) (I)$$

$$\sin \alpha = \frac{m-1}{f} \quad -\frac{\pi}{2} < \alpha < \frac{\pi}{2}$$

$$-\frac{\pi}{2} < \alpha < \frac{\pi}{2} \quad \alpha^2 \text{ و } -\frac{\pi}{2} < 2\alpha < \frac{\pi}{2}$$

$$-\frac{1}{f} < \frac{m-1}{f} \leq 1 \Rightarrow -2 < m-1 \leq f \Rightarrow -1 < m \leq a \quad (4)$$

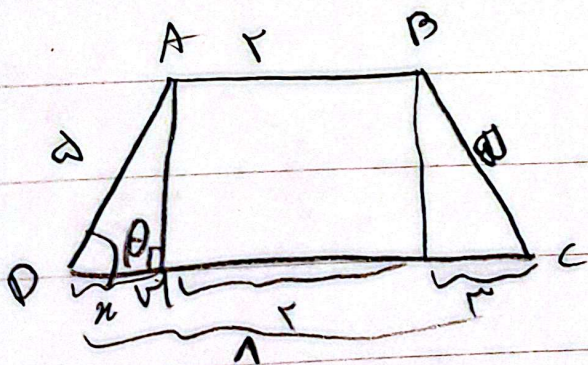
$$\pi < \alpha < 2\pi \quad \tan \alpha + \cot \alpha = -\mu$$

$$\frac{\sin \alpha}{\cos \alpha} + \frac{\cos \alpha}{\sin \alpha} = \frac{\sin^2 \alpha + \cos^2 \alpha}{\cos \alpha \sin \alpha} = -\mu \Rightarrow \cos \alpha \sin \alpha = -\frac{1}{\mu}$$

$$\pi < \alpha < 2\pi \Rightarrow \frac{\pi}{f} < \alpha < \pi \quad |\sin \alpha| < |\cos \alpha| \rightarrow \text{در نامه اول}$$

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

$$(\sin \alpha \cos \alpha)^2 = \sin^2 \alpha \cos^2 \alpha + \sin \alpha \cos \alpha = \frac{1}{\mu} \Rightarrow \sin \alpha \cos \alpha = \frac{1}{\mu} \Rightarrow \frac{-1}{\sqrt{\mu}} = \sin \alpha \cos \alpha$$



$$\cos \theta = 0,9$$

$$\Rightarrow \frac{DM}{DA} = \frac{9}{10} = \frac{r}{a} \Rightarrow DM = \mu$$

$$AM = \sqrt{a^2 - 1} = r$$

$$S = \frac{(a+b) \times h}{2} = 20$$

Subo

$$\begin{aligned} \tan(110^\circ) \tan(-150^\circ) - \sin(110^\circ) \cos(110^\circ) &= k \cos 110^\circ \quad \textcircled{a} \\ &= \tan(180^\circ + 10^\circ) \tan(180^\circ - 150^\circ) - \sin(180^\circ + 10^\circ) \cos(180^\circ - 150^\circ) \\ &= (-\cot 10^\circ) (\tan 150^\circ) - (\sin 10^\circ) (-\sin 150^\circ) \quad \textcircled{b} \\ &= \frac{-1 + \sin^2 10^\circ}{-\cos^2 10^\circ} = k \cos^2 10^\circ \Rightarrow k = -1 \end{aligned}$$

$$\begin{aligned} A &= \sqrt{r} \cos(110^\circ) \cdot \sin(110^\circ) - \sqrt{r} \sin(110^\circ) \cos(110^\circ) \quad \textcircled{c} \\ &= \sqrt{r} \cos(180^\circ + 10^\circ) \sin(180^\circ - 10^\circ) - \sqrt{r} (\sin(180^\circ + 10^\circ) \cos(180^\circ - 10^\circ)) \\ &= (\sqrt{r} (-\cos 10^\circ) (-\sin 10^\circ)) - \sqrt{r} (\sin 10^\circ) (-\cos 10^\circ) \end{aligned}$$

$$\begin{aligned} &= \sqrt{r} \left(\frac{\sqrt{r}}{r} \right) (-\cos 10^\circ) + \sqrt{r} \frac{\sqrt{r}}{r} (\cos 10^\circ) = \\ &(\cos 10^\circ) \left(\frac{r}{r} + \frac{r}{r} \right) = \frac{2}{r} (\cos 10^\circ) \Rightarrow \text{سر } \frac{2}{r} \quad \textcircled{d} \end{aligned}$$

$$\begin{aligned} f(x) &= 14 \cos^2(x) \cos^2(2x) \cos^2(4x) \cos^2(8x) \quad \textcircled{e} \\ f\left(\frac{\pi}{8}\right) &= 14 \cos^2\left(\frac{\pi}{8}\right) \cos^2\left(\frac{\pi}{4}\right) \cos^2(\pi) \cos^2\left(\frac{2\pi}{4}\right) \end{aligned}$$

$$\cos^2 \frac{\pi}{8} = \frac{1 + \cos \frac{\pi}{4}}{2} = \frac{1 + \frac{\sqrt{2}}{2}}{2} = \frac{2 + \sqrt{2}}{4}$$

$$\Rightarrow \left(14 \times \frac{2 + \sqrt{2}}{4} \right) \times \left(\frac{\sqrt{2}}{2} \right)^2 \times (-1)^2 \times \left(\frac{-1}{2} \right)^2$$

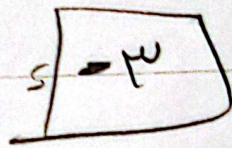
$$\frac{7 + 7\sqrt{2}}{2}$$

$$\frac{1 - \sin \alpha}{1 + \sin \alpha} = r$$

سواء كان α حاداً

(9)

$$\tan \frac{\alpha}{2} = \frac{\sin \alpha}{1 + \cos \alpha} \rightarrow \frac{\frac{-r}{a}}{1 - \frac{r}{a}} = \frac{\frac{2}{a}}{-\frac{1}{a}}$$



$$\frac{1 - \sin \alpha}{1 + \sin \alpha} = r \Rightarrow 1 - \sin \alpha = r + r \sin \alpha \quad \begin{cases} \sin \alpha = -\frac{r}{a} \\ \sin \alpha = \frac{-r}{a} \end{cases}$$

(9)

$$1 - \sin^2 \alpha = \cos^2 \alpha \Rightarrow 1 - \frac{r^2}{a^2} = \frac{19}{a^2} \Rightarrow \cos \alpha = \frac{-r}{a}$$

$$\frac{\sin \theta}{1 - \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = k \cot \frac{\theta}{r}$$

(9)

$$\cot \frac{\theta}{r} = \frac{1 + \cos \theta}{\sin \theta} = \frac{\sin \theta}{1 - \cos \theta}$$

$$k = r$$

(9)

$$\sin \alpha = \frac{\sqrt{5}}{10}$$

(10)

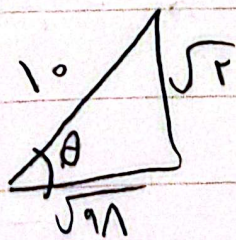
$$\cos \left(\frac{11\pi}{8} + \alpha \right) = \cos \left(\pi + \frac{3\pi}{8} + \alpha \right)$$

(9)

$$= \cos \left(-\frac{3\pi}{8} + \alpha \right) = \cos \frac{3\pi}{8} \cos \alpha - \sin \frac{3\pi}{8} \sin \alpha$$

$$\Rightarrow \left(-\frac{\sqrt{5}}{r} \times \frac{-\sqrt{91}}{10} \right) - \left(\frac{\sqrt{5}}{r} \right) \left(\frac{\sqrt{5}}{10} \right)$$

$$\frac{+1r}{r} = \frac{r}{r} = \frac{1r}{r} = \frac{r}{r}$$



$$v) f\left(\frac{\pi}{\mu^4}\right) = 14 \cos^2\left(\frac{\pi}{14}\right) \cos^2\left(\frac{\pi}{7}\right) \cos^2\left(\frac{\pi}{\mu}\right) \cos^2\left(\frac{\mu\pi}{\mu}\right)$$

$$\cos^2\frac{\pi}{14} = \frac{1 + \cos\frac{\pi}{7}}{2} = \frac{\mu + \sqrt{\mu}}{2}$$

$$\begin{aligned} & \downarrow \\ & 14 \left(\frac{\mu + \sqrt{\mu}}{2}\right) \times \frac{\mu}{2} \times \frac{1}{2} \times \frac{1}{2} \\ & = \frac{\mu(\mu + \sqrt{\mu})}{4} \end{aligned}$$