

Subject:

Year: Month: Day:

$$\cot \alpha = \frac{\cos \alpha}{\sqrt{1 - \cos^2 \alpha}} \Rightarrow \frac{\cos \alpha}{|\sin \alpha|} = \frac{\cos \alpha}{\sin \alpha} \Rightarrow \sin \alpha > 0 \Rightarrow \text{نیمه اول باشد} \quad (1)$$

$$\frac{1}{|\cos \alpha|} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 - \sin \alpha}{|\cos \alpha|} \xrightarrow{\cos \alpha > 0} \frac{1 - \sin \alpha}{\cos \alpha} = \frac{1 - \sin \alpha}{\cos \alpha} \checkmark \Rightarrow \text{نیمه اول}$$

$$\xrightarrow{\cos \alpha < 0} \frac{-1 - \sin \alpha}{\cos \alpha} = \frac{\sin \alpha + 1}{\cos \alpha} \times \Rightarrow \cos \alpha < 0$$

$$-\frac{\pi}{4} < \alpha < \frac{\pi}{4} \rightarrow \text{Diagram of a circle with a shaded sector in the first quadrant. The angle is } \alpha \text{ and the y-coordinate is } \frac{1}{4}.$$

$$-\frac{1}{4} < \sin \alpha \leq 1 \quad (2)$$

$$\frac{1}{4} < \frac{m-1}{4} \leq 1 \rightarrow -1 < m-1 \leq 4 \rightarrow -1 < m \leq 5 \Rightarrow m \in (-1, 5]$$

$$\tan \alpha + \cot \alpha = \frac{\sin \alpha}{\cos \alpha} + \frac{\cos \alpha}{\sin \alpha} = -\mu \Rightarrow \cos \alpha \sin \alpha = -\frac{1}{\mu} \quad (3)$$

$$\cos^4 \alpha + \sin^4 \alpha = (\cos \alpha + \sin \alpha)(\cos \alpha - \sin \alpha - \sin \alpha \cos \alpha + \cos \alpha \sin \alpha) = \frac{4}{\mu} (\cos \alpha + \sin \alpha)$$

$$\Rightarrow \frac{1}{\cos^4 \alpha + \sin^4 \alpha} = \frac{\mu}{4} \times \frac{1}{\cos \alpha + \sin \alpha} = A \xrightarrow{\text{نشان}} A^2 = \frac{4}{16} \times \frac{1}{(\cos^2 \alpha + \sin^2 \alpha + 2 \cos \alpha \sin \alpha)}$$

$$A^2 = \frac{4}{16} = \frac{\mu}{4} \Rightarrow A = \frac{\mu \sqrt{\mu}}{4}$$

$$\text{Diagram: A trapezoid ABCD with height h and top base AB = \mu. Points F and E are on the bottom base CD such that CF = FE = ED = \mu. BE and AF are drawn, forming rectangle ABEF.$$

$$\cos \theta = \frac{\mu}{\omega} = \frac{4}{10} \rightarrow \mu = 4 \quad (4)$$

$$\omega^2 = \mu^2 + h^2 \rightarrow h = 4 \rightarrow \hat{C} = \hat{D}$$

$$\rightarrow CF = ED = \mu, BE = AF = 4 \Rightarrow \text{مستطیل ABEF}$$

$$\rightarrow AB = FE = \mu \rightarrow \text{طول وتر } = 4 \rightarrow S_{\text{دورنگ}} = \frac{4 + \mu}{2} \times 4 \Rightarrow S_{\Delta} = 4$$

$$\tan\left(\frac{3\pi}{4} + 1\alpha\right) \times \tan(-\pi + 1\alpha) - \sin 1\alpha \cos\left(\frac{3\pi}{4} - 1\alpha\right) \quad (a)$$

$$\hookrightarrow (-\cot 1\alpha \tan 1\alpha) - (\sin 1\alpha \times -\sin 1\alpha) = -1 + \sin^2 1\alpha = -\cos^2 1\alpha \Rightarrow k = -1$$

$$A = \sqrt{r} \times \frac{-\sqrt{r}}{r} \times \sin\left(\frac{3\pi}{4} - 2V\right) - \left(\sqrt{r} \times \frac{\sqrt{r}}{r} \times \cos(\pi - 2V)\right) \quad (g)$$

$$A = \frac{r}{r} \times \cos 2V - (-\cos 2V) = \frac{a}{r} \cos 2V \rightarrow \text{بإب } \frac{a}{r}$$

$$f\left(\frac{\pi}{19}\right) = 19 \underbrace{\cos^2\left(\frac{\pi}{19}\right)}_{14 \left(\frac{1+\cos\left(\frac{\pi}{9}\right)}{2}\right)} \times \underbrace{\cos^2\left(\frac{\pi}{9}\right)}_{\frac{r}{r}} \times \underbrace{\cos^2\left(\frac{\pi}{9}\right)}_{\frac{1}{r}} \times \underbrace{\cos^2\left(\frac{\pi}{9}\right)}_{\frac{1}{r}} \quad (v)$$

$$\Rightarrow \frac{r}{r} \left(\frac{1+\sqrt{r}}{2}\right) \Rightarrow \frac{9+3\sqrt{r}}{19}$$

$$\frac{1 - \sin \alpha}{1 + \sin \alpha} = r \rightarrow 1 - \sin \alpha = r + r \sin \alpha \rightarrow a \sin \alpha = -r \Rightarrow \sin \alpha = \frac{-r}{a} \quad (A)$$

$$\cos \alpha = \frac{-r}{a}$$

$$\tan \frac{\alpha}{2} = \frac{\sin \frac{\alpha}{2}}{\cos \frac{\alpha}{2}} = \frac{\sqrt{\frac{1 - \cos \alpha}{2}}}{\sqrt{\frac{1 + \cos \alpha}{2}}} \Rightarrow \frac{|1 - \cos \alpha|}{|\sin \alpha|}$$

$$\Rightarrow \frac{-(1 - \cos \alpha)}{\sin \alpha} = \frac{1 + \frac{r}{a}}{\frac{r}{a}} = \frac{a}{r} = r$$

$$\frac{\sin^2 \theta + (1 - \cos^2 \theta)}{\sin \theta (1 - \cos \theta)} = \frac{r \sin^2 \theta}{\sin \theta (1 - \cos \theta)} = \frac{r \sin \theta \cos \theta}{r \sin^2 \theta} = r \cot \frac{\theta}{2} \quad (g)$$

$$\Rightarrow k = r$$

$$\frac{11\pi}{r} \rightarrow \frac{11\pi}{r} + \frac{3\pi}{r} \Rightarrow \cos\left(\frac{14\pi}{r} + \alpha\right) / \cos^2 \alpha = 1 - \sin^2 \alpha \rightarrow 1 - \frac{r}{10} = \frac{9r}{10} \rightarrow \cos \alpha = \frac{1 - \sqrt{r}}{10}$$

$$\cos \frac{14\pi}{r} \cos \alpha - \sin \frac{14\pi}{r} \sin \alpha \Rightarrow \frac{1 - \sqrt{r}}{10} \times \frac{1 - \sqrt{r}}{10} - \frac{\sqrt{r}}{10} \times \frac{\sqrt{r}}{10}$$

$$\hookrightarrow \frac{1 - \sqrt{r}}{10} - \frac{1 - \sqrt{r}}{10} = \frac{r}{10} = 0, \quad r = \frac{r}{a}$$