

$$\frac{1}{\sqrt{\cos^2 \alpha}} - \frac{1}{\cot \alpha} = \frac{1 - \sin \alpha}{|\cos \alpha|} \quad \cot \alpha = \frac{\cos \alpha}{\sqrt{1 - \cos^2 \alpha}} \quad \frac{1}{\sqrt{\cos^2 \alpha}} - \frac{1}{\cot \alpha} = \frac{1 - \sin \alpha}{|\cos \alpha|} \Rightarrow$$

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

$$\cot \alpha = \frac{\cos \alpha}{\sqrt{1 - \cos^2 \alpha}} = \frac{\cos \alpha}{|\sin \alpha|} \Rightarrow \frac{\cos \alpha}{|\sin \alpha|} = \frac{\cos \alpha}{\sin \alpha} \rightarrow \sin \alpha > 0 \quad (2) \quad (1) \cap (2) \Rightarrow$$

در هر دو ربع اول و دوم

$$-\frac{\pi}{2} < \frac{\alpha}{2} < \frac{\pi}{2} \rightarrow -\frac{\pi}{4} < \frac{\alpha}{4} < \frac{\pi}{4} \rightarrow -\frac{1}{\sqrt{2}} < \sin \frac{\alpha}{2} \leq 1 \rightarrow -\frac{1}{\sqrt{2}} < \frac{m-1}{2} \leq 1$$

$$-2 < m-1 < 2 \rightarrow -1 < m \leq 3$$

$-1 < m \leq 3$ جواب

$$\tan \alpha + \cot \alpha = \frac{1}{\sin \alpha \cos \alpha} = \frac{1}{p} \rightarrow \sin \alpha \cos \alpha = \frac{1}{p} \quad \sin^2 \alpha + \cos^2 \alpha = 1$$

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

$$\sin^2 \alpha + \cos^2 \alpha = (\sin \alpha + \cos \alpha)^2 - 2 \sin \alpha \cos \alpha = \frac{1}{p} - 2 \times \frac{1}{p} = \frac{1}{p} - \frac{2}{p} = -\frac{1}{p}$$

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

$\cos \alpha = \frac{BH}{AB} = \frac{4}{10} \rightarrow BH = 4$
 $AH^2 + BH^2 = AB^2 \Rightarrow AH^2 + 16 = 100 \rightarrow AH = 8$

$\triangle ABH \cong \triangle DCH \Rightarrow \begin{cases} \hat{A} = \hat{D} \\ \hat{B} = \hat{C} = \alpha \\ \hat{H} = \hat{H}' = 90^\circ \end{cases} \Rightarrow CH = BH = 4$

$S_{\text{کل}} = S_{\text{مستطیل}} + 2S_{\text{مثلث}} = 4 \times 8 + \frac{4 \times 8}{2} \times 2 = 32 + 32 = 64$

$$\tan(2\pi) \tan(-140^\circ) - \sin(140^\circ) \cos(2\pi) =$$

$$\tan\left(\frac{\pi}{2} + 10^\circ\right) \tan(10^\circ - \pi) - \sin(4\pi + 10^\circ) \cos\left(\frac{\pi}{2} - 10^\circ\right) =$$

$$-\cot 10^\circ \times \tan 10^\circ - \sin 10^\circ \times -\sin 10^\circ =$$

$$-1 + \sin^2 10^\circ = -(1 - \sin^2 10^\circ) = -\cos^2 10^\circ \rightarrow k \cos^2 10^\circ = -\cos^2 10^\circ \Rightarrow$$

$k = -1$

$$A = \sqrt{r} \cos(\pi) \sin(\pi) - \sqrt{r} \sin(\pi) \cos(\pi) = \sqrt{r} \left(\frac{-\sqrt{r}}{r} \right) \left(-\cos(\pi) \right) - \sqrt{r} \left(\frac{\sqrt{r}}{r} \right) \left(-\cos(\pi) \right) = \frac{r}{r} \cos(\pi) + \cos(\pi) = \frac{2}{r} \cos(\pi)$$

$$\frac{\partial \cos(\pi)}{\partial \cos(\pi)} = \left[\frac{2}{r} \right]$$

$$f(m) = 14 \cos^2\left(\frac{\pi}{12}\right) \cos^2\left(\frac{\pi}{4}\right) \cos^2\left(\frac{\pi}{6}\right) \cos^2\left(\frac{\pi}{12}\right) = 14 \cos^2\left(\frac{\pi}{12}\right) \cos^2\left(\frac{\pi}{4}\right) \cos^2\left(\frac{\pi}{6}\right)$$

$$\cos^2\left(\frac{\pi}{12}\right) = 14 \cos^2\left(\frac{\pi}{12}\right) \times \frac{r}{r} \times \frac{1}{r} \times \frac{1}{r} = \frac{r}{r} \times \cos^2\left(\frac{\pi}{12}\right)$$

$$\cos^2\left(\frac{\pi}{12}\right) = \frac{1 + \cos \frac{\pi}{6}}{2} = \frac{1 + \frac{\sqrt{3}}{2}}{2} = \frac{2 + \sqrt{3}}{4} = \frac{r + \sqrt{r}}{r} \times \frac{r}{r} = \frac{4 + r\sqrt{r}}{4r}$$

$$\frac{1 - \sin \alpha}{1 + \sin \alpha} = \frac{r}{0} \Rightarrow \tan \alpha = \frac{r}{r \sin \alpha} \Rightarrow \sin \alpha = -\frac{r}{0} \Rightarrow \cos \alpha = 1 - \sin \alpha = \frac{14}{10}$$

$$\cos \alpha = \frac{-r}{0} \Rightarrow \tan \frac{\alpha}{2} = \frac{\sin \alpha}{1 + \cos \alpha} = \frac{-r}{1 - \frac{r}{0}} = \left[\frac{r}{1} \right]$$

$$\frac{\sin \alpha}{1 - \cos \alpha} + \frac{1 + \cos \alpha}{\sin \alpha} \rightarrow \frac{\sin \alpha}{1 - \cos \alpha} = \frac{r \cos \frac{\alpha}{2} \sin \frac{\alpha}{2}}{r \sin^2 \frac{\alpha}{2}} = \frac{\cos \frac{\alpha}{2}}{\sin \frac{\alpha}{2}} = \cot \frac{\alpha}{2}$$

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

$$\frac{1 + \cos \alpha}{\sin \alpha} = \cot \frac{\alpha}{2} \Rightarrow \cot \frac{\alpha}{2} = \cot \frac{\alpha}{2} + \cot \frac{\alpha}{2} = r \cot \frac{\alpha}{2} + k \cot \frac{\alpha}{2} \quad (k = r)$$

$$\sin \alpha = \frac{\sqrt{r}}{1} \rightarrow \cos \alpha = 1 - \sin^2 \alpha \Rightarrow \cos \alpha = \pm \frac{\sqrt{r}}{1} \rightarrow \frac{-\sqrt{r}}{1}$$

$$\cos\left(\frac{11\pi}{r} + \alpha\right) = \underbrace{\left(\cos\left(\frac{11\pi}{r}\right)\right)}_{\cos\left(\frac{r\pi}{r}\right)} \underbrace{\left(\cos(\alpha)\right)}_{\sin\left(\frac{r\pi}{r}\right)} - \underbrace{\left(\sin\left(\frac{11\pi}{r}\right)\right)}_{\sin\left(\frac{r\pi}{r}\right)} \underbrace{\left(\sin(\alpha)\right)}_{\sin(\alpha)}$$

$$\left(\frac{-\sqrt{r}}{r}\right) \left(\frac{-\sqrt{r}}{1}\right) - \left(\frac{\sqrt{r}}{r}\right) \left(\frac{\sqrt{r}}{1}\right) = \frac{r}{r} - \frac{r}{r} = \frac{r}{r} = \left[\frac{4}{10} = \frac{r}{0} \right]$$