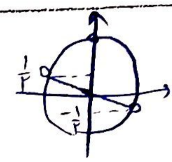
نام و نام خانوادگی ......علی صنعتی...... پاسخنامه تشریحی تکلیف شماره ۲۸..... کلاس ...یازدهم سیر A...

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

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

$\rightarrow \cos\alpha > 0 \quad (2) \xrightarrow{(1),(2)}$ در ناحیه اول مثلثاتی α



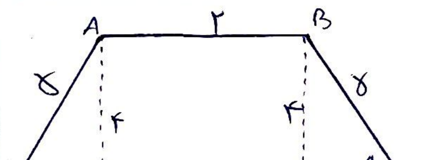
$$\frac{-\pi}{12} < x < \frac{5\pi}{12} \rightarrow \frac{-\pi}{6} < 2x < \frac{5\pi}{6} \xrightarrow{\sin 2x = \frac{m-1}{4}} -\frac{1}{2} < \frac{m-1}{4} \leq 1$$

$$\rightarrow -2 < m-1 \leq 4 \rightarrow -1 < m \leq 5$$ 2

$$\tan x + \cot x = \frac{1}{\sin x\cos x} = -3 \rightarrow \sin x\cos x = -\frac{1}{3} \rightarrow (\sin x+\cos x)^2 = 1+2\sin x\cos x$$

$$= \frac{1}{3} \rightarrow |\sin+\cos| = \frac{\sqrt{3}}{3} \xrightarrow{\frac{3\pi}{4}<x<\pi} \sin x+\cos x = \frac{-\sqrt{3}}{3}$$ 3

$$\rightarrow \frac{1}{\sin^3x+\cos^3x} = \frac{1}{(\sin+\cos)(\sin^2+\cos^2-\sin\cos)} = \frac{1}{\frac{-\sqrt{3}}{3}\left(1+\frac{1}{3}\right)} = \frac{-9}{4\sqrt{3}}$$



$$\cos\theta = \frac{EC}{BC} = \frac{EC}{5} = \frac{6}{10} \rightarrow EC = 3 \xrightarrow{\text{فیثاغورث}} \boxed{BE = 4}$$ 4

$$\rightarrow \frac{HD}{DA} = \frac{HD}{5} = \frac{6}{10} \rightarrow HD = 3$$

$$\rightarrow \boxed{DC = 8} \rightarrow S = \frac{(AB+DC)(BE)}{2} = \frac{(2+8)(4)}{2} = 20$$

$$\tan(285^\circ)\tan(-165^\circ) - \sin(1095^\circ)\cos(255^\circ) = \tan\left(\frac{3\pi}{2}+15^\circ\right)\tan(-\pi+15^\circ)$$

$$-\sin(6\pi+15^\circ)\cos\left(\frac{3\pi}{2}-15^\circ\right) = (-\cot 15^\circ)(\tan 15^\circ) - (\sin 15^\circ)(-\sin 15^\circ)$$ 5

$$= -1-(-\sin^2 15) = -1+\sin^2 15 = -\cos^2 15 \rightarrow k = -1$$

$$A = \sqrt{۳}\cos(۲۱۰^\circ)\sin(۲۴۳^\circ) - \sqrt{۲}\sin(۱۳۵^\circ)\cos(۱۵۳^\circ)$$

$$= -\frac{۳}{۲}\sin\left(\frac{۳\pi}{۲} - ۲۷^\circ\right) - (۱)\cos(\pi - ۲۷^\circ) = -\frac{۳}{۲}(-\cos ۲۷^\circ) - (-\cos ۲۷^\circ)$$ ۶

$$= ۲/۵\cos ۲۷^\circ \longrightarrow \frac{A}{\cos ۲۷^\circ} = ۲/۵$$

$$\cos ۱۵^\circ = \cos(۴۵^\circ - ۳۰^\circ) = \cos ۴۵ \cos ۳۰ + \sin ۴۵^\circ \sin ۳۰^\circ = \frac{\sqrt{۶}}{۴} + \frac{\sqrt{۲}}{۴} = \frac{\sqrt{۶}+\sqrt{۲}}{۴}$$

$$\longrightarrow ۱۶\cos^۲(۱۵^\circ)\cos^۲(۳۰^\circ)\cos^۲(۶۰^\circ)\cos^۲(۱۲۰^\circ) = ۱۶\left(\frac{\sqrt{۶}+\sqrt{۲}}{۴}\right)^۲\left(\frac{\sqrt{۳}}{۲}\right)^۲\left(\frac{۱}{۲}\right)^۲\left(-\frac{۱}{۲}\right)^۲$$ ۷

$$= \cancel{۱۶}\,\frac{۸+۲\sqrt{۱۲}}{\cancel{۱۶}} \times \frac{۳}{۴} \times \frac{۱}{۴} \times \frac{۱}{۴} = \frac{۲۴+۶\sqrt{۱۲}}{۶۴} = \frac{۶+۳\sqrt{۳}}{۱۶}$$

$$\frac{۱-\sin x}{۱+\sin x} = ۴ \rightarrow ۱-\sin x = ۴+۴\sin x \longrightarrow ۵\sin x = -۳ \rightarrow \sin x = -\frac{۳}{۵}$$

$$\xrightarrow{\text{ربع سوم}} \cos x = -\frac{۴}{۵} \longrightarrow \tan\left(\frac{x}{۲}\right) = \frac{۱-\cos x}{\sin x} = \frac{\sin x}{۱+\cos x} = \frac{-\frac{۳}{۵}}{\frac{۱}{۵}} = -۳$$ ۸

$$\frac{\sin\alpha}{۱+\cos\alpha} = \frac{۲\sin\frac{\alpha}{۲}\cos\frac{\alpha}{۲}}{۲\cos^۲\frac{\alpha}{۲}} = \tan\frac{\alpha}{۲} \quad \Bigg\} \quad \frac{۱-\cos\alpha}{\sin\alpha} = \frac{۲\sin^۲\frac{\alpha}{۲}}{۲\sin\frac{\alpha}{۲}\cos\frac{\alpha}{۲}} = \tan\frac{\alpha}{۲}$$ ۹

$$\rightarrow \frac{\sin\alpha}{۱-\cos\alpha} + \frac{۱+\cos\alpha}{\sin\alpha} = \cot\frac{\alpha}{۲} + \cot\frac{\alpha}{۲} = ۲\cot\frac{\alpha}{۲} = k\cot\frac{\alpha}{۲}$$

$$\longrightarrow k = ۲$$

$$\sin\alpha = \frac{\sqrt{۲}}{۱۰} \rightarrow \sin^۲ + \cos^۲ = ۱ \rightarrow \cos^۲\alpha = \frac{۹۸}{۱۰۰} \xrightarrow{\text{ربع دوم}} \cos\alpha = -\frac{\sqrt{۹۸}}{۱۰}$$

$$\longrightarrow \cos\left(\frac{۱۱\pi}{۴} + \alpha\right) = \left(\cos\frac{۱۱\pi}{۴}\right)(\cos\alpha) - \left(\sin\frac{۱۱\pi}{۴}\right)\sin\alpha = \left(\frac{-\sqrt{۲}}{۲}\right)\left(-\frac{\sqrt{۹۸}}{۱۰}\right)$$ ۱۰

$$-\left(\frac{\sqrt{۲}}{۲}\right)\left(\frac{\sqrt{۲}}{۱۰}\right) = \frac{۱۴}{۲۰} - \frac{۲}{۲۰} = \frac{۱۲}{۲۰}$$