امیرحسین نیرخواستی یازدهم ریاضی ۸ (دی)

(۱)

$$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha > 0$$

$$\rightarrow \cos\alpha > 0,\ \sin\alpha > 0 \rightarrow \boxed{(۱)}$$

$$\cot\alpha = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow \cot\alpha > 1$$

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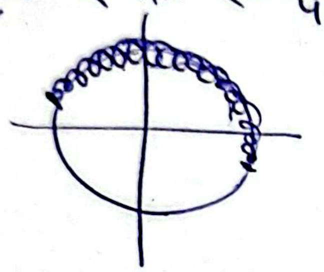
(۲)

$$\frac{-\pi}{6} < 2x < \frac{5\pi}{6} \Rightarrow \frac{-1}{2} < \sin 2x \le 1 \Rightarrow \frac{-1}{2} < \frac{m-1}{4} \le 1$$



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$$-2 < m-1 \le 4$$

$$\Rightarrow \boxed{-1 < m < 5}$$

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(۳)

$$\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = \frac{1}{\sin x\cos x} = -3 \rightarrow \sin x\cos x = \frac{-1}{3}$$

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

$$\rightarrow \sin x + \cos x = \frac{-1}{\sqrt{3}} \Rightarrow \frac{1}{(\sin x + \cos x)(1 - \sin x\cos x)}$$

$$\frac{1}{\left(\frac{-1}{\sqrt{3}}\right)\left(1+\frac{1}{3}\right)} = \frac{-3}{4}\sqrt{3}$$

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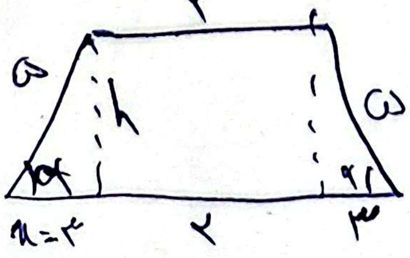
(۴)



$$\cos\alpha = \frac{6}{10} \rightarrow \frac{x}{5} = 0.6 \rightarrow x = 3$$

$$\rightarrow a^2 + b^2 = c^2 \Rightarrow h = 4$$

$$S = \frac{(2+8)4}{2} = \text{(۲۰)}$$

$$-\tan\left(\frac{3\pi}{2}+\theta\right)\tan(\pi-\theta)-\sin(4\pi+\theta)\cos\left(\frac{3\pi}{2}-\theta\right)= \quad (3)$$

$$(\cot\theta)(-\tan\theta) \to +\sin\theta\sin\theta = -1+\sin^2\theta =$$

$$-\left(\frac{\sin^2\theta}{\cos^2\theta}\right) = -1 \quad (1)$$

$$A=\sqrt{3}\times\left(-\frac{\sqrt{2}}{2}\right)\sin\left(\frac{7\pi}{2}-\alpha\right)-\left(\frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{2}\right)\cos(\pi-7\alpha)= \quad (4)$$

$$\frac{5}{2}\cos\alpha+\cos\alpha = \frac{7}{2}\cos\alpha$$

$$\frac{\frac{7}{2}\cos\alpha}{\cos\alpha} = \frac{7}{2}$$

$$f\left(\frac{\pi}{24}\right)=14\cos^2\left(\frac{\pi}{12}\right)\cos^2\left(\frac{\pi}{4}\right)\cos^2\left(\frac{\pi}{6}\right)\cos^2\left(\frac{\pi}{3}\right) \quad (5)$$

$$=14\left(\frac{1+\cos\left(\frac{\pi}{6}\right)}{2}\right)\cos^2\left(\frac{\pi}{4}\right)\cos^2\left(\frac{\pi}{6}\right)\cos^2\left(\frac{\pi}{3}\right)=$$

$$14\left(\frac{2+\sqrt{3}}{4}\right)\left(\frac{\sqrt{2}}{2}\right)^2\left(\frac{1}{2}\right)^2\left(\frac{1}{2}\right)^2 = \frac{7+4\sqrt{3}}{8}$$

$$8+8\sin\alpha = 1-\sin\alpha \Rightarrow 9\sin\alpha = -8 \quad (6)$$

$$\Rightarrow \sin\alpha = \frac{-8}{9},\ \cos\alpha = \frac{-4}{9}$$

$$\Rightarrow \tan\frac{\alpha}{2} = \sqrt{\frac{1-\cos\alpha}{1+\cos\alpha}} = \sqrt{\frac{\frac{13}{9}}{\frac{5}{9}}} = \sqrt{9} = 3 \quad (7)$$

امیدین نژدخراسانی یازدهم ۱۱A کامپیوتر

(۹)

$$\frac{2\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{2\sin^2\frac{\theta}{2}} = \frac{\cos\frac{\theta}{2}}{\sin\frac{\theta}{2}} = \cot\frac{\theta}{2}$$

$$\frac{2\cos^2\frac{\theta}{2}}{2\sin\frac{\theta}{2}\cos\frac{\theta}{2}} = \frac{\cos\frac{\theta}{2}}{\sin\frac{\theta}{2}} = \cot\frac{\theta}{2}$$

$$\Longrightarrow 2\cot\frac{\theta}{2}$$

$$\boxed{k=2}$$

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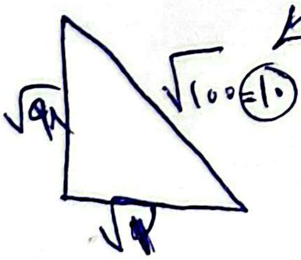
(۱۰)

$$\cos\left(\frac{11\pi}{4}+\alpha\right) = \cos\left(\frac{8\pi}{4}+\frac{3\pi}{4}+\alpha\right) = \cos\left(\frac{3\pi}{4}+\alpha\right)$$

$$= \cos\frac{3\pi}{4}\cos\alpha - \left(\sin\frac{3\pi}{4}\sin\alpha\right) \Rightarrow \sin\alpha = \frac{\sqrt{2}}{10}$$



$$\Rightarrow \cos\alpha = \frac{\sqrt{98}}{10}$$

$$\Rightarrow \left(\frac{-\sqrt{2}}{2}\times\frac{\sqrt{98}}{10}\right) - \left(\frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{10}\right) =$$

$$\frac{-\sqrt{196}}{20} - \frac{2}{20} = \frac{-14}{20} - \frac{2}{20} = \frac{-16}{20} = \boxed{\frac{-8}{10}}$$