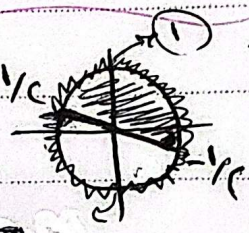
Subject : ( ) حسابی یازدهم نصره A Date :

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

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

$\rightarrow \frac{\cos\alpha}{|\sin\alpha|} = \frac{|\cos\alpha|}{\sin\alpha} \rightarrow \cos\alpha > 0 \rightarrow$ ناحیه اول است ★

(2) $-\pi/4 < -\frac{\pi}{4} < 2\pi < \frac{9\pi}{4} < 3\pi/4$

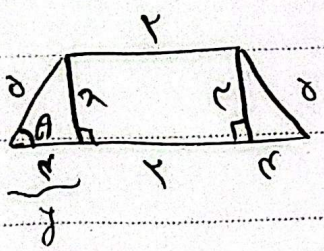


$-\frac{1}{2} < \frac{m-1}{4} \leq 1$

$-2 < m-1 \leq 4$

$-1 < m \leq 5$ ← $(-1, 5]$

(3) $\cos\theta = \frac{x}{5} = \frac{4}{10} \rightarrow x = 3$ مثلث قائم‌الزاویه $y = 4$



$S = \frac{(4+6)\times 4}{2} = 18$

(4) $\tan(\frac{5\pi}{2} + 15)\times\tan(\pi - 15) - \sin(15)\times\cos(\frac{5\pi}{6} - 15) =$

$-\cot\times\tan = -1$ $\quad -\sin\times\sin = -1 + \sin^2 15 =$

$-1 + 1 - \cos^2 15 = -\cos^2 15 \rightarrow K = -1$

(4) $\sqrt{6}\times\frac{-\sqrt{6}}{2}\times\sin(\frac{5\pi}{6} - 27) - \sqrt{2}\times\frac{\sqrt{2}}{2}\times\cos(\pi - 27)$

$-\frac{3}{2}\times -\cos + \cos = 1.5\cos 27 + \cos 27 = 2.5\cos 27$

Arman

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$$\frac{\sin^2 4x}{16\cos^2 4x} \times \frac{\frac{1}{2}\sin^2 4x}{\cos^2 4x} \times \frac{\frac{1}{2}\sin^2 12x}{\cos^2 12x} \times \frac{\frac{1}{2}\sin^2 24x}{\cos^2 24x} = \frac{1}{2}\sin^2 48x \quad (7)$$

A

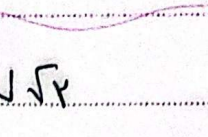
$$\frac{\sin^2 4x}{16 \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \sin^2 48x} = \frac{\sin^2 48x}{\sin^2 3x} \xrightarrow{x=\pi/24} \frac{\sin^2 \frac{12\pi}{3}}{\sin^2 \frac{\pi}{12}}$$

$$\sin^2 \frac{\pi}{12} = \frac{1-\cos\frac{\pi}{6}}{2} = \frac{2-\sqrt{3}}{4}$$

$$A = \frac{\frac{3}{4}}{\frac{2-\sqrt{3}}{4}} = \frac{3}{2-\sqrt{3}}$$

$$\frac{\sin\theta}{1-\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = \cot\frac{\theta}{2} + \cot\frac{\theta}{2} \rightarrow K = 2 \quad (9)$$

$$\sin\alpha = \frac{\sqrt{2}}{10} \qquad \cos\alpha = -7\sqrt{2} \quad (10)$$

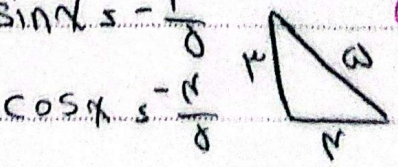


$$\cos\left(\frac{3\pi}{2}+\alpha\right) = \cos\frac{3\pi}{2}\cos\alpha - \sin\frac{3\pi}{2}\sin\alpha$$

$$= \frac{\sqrt{6}}{4} \times -7\sqrt{2} - \frac{\sqrt{6}}{2} \times \frac{\sqrt{2}}{10} = 7 - 10 = -3$$

$$1 - \sin x = 2 + 2\sin x \rightarrow 3\sin x = -2 \rightarrow \sin x = -\frac{2}{3} \quad (11)$$

$$\cos x = -\frac{\sqrt{5}}{3}$$



$$\tan\frac{x}{2} = \frac{1+\frac{2}{\sqrt{5}}}{-\frac{\sqrt{5}}{3}} = \frac{\frac{3}{\sqrt{5}}}{-\frac{2}{3}} = -2$$

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(۳)

$$\tan\alpha + \cot\alpha = \frac{1}{\cos\alpha\sin\alpha} = -۳ \rightarrow \cos\alpha\sin\alpha = \frac{-1}{۳}$$

$$\cos^۳\alpha + \sin^۳\alpha = (\cos\alpha + \sin\alpha)(\underbrace{\cos^۲\alpha + \sin^۲\alpha - \sin\alpha\cos\alpha}_{۴/۳})$$

$$\text{طرفین} ۲ \rightarrow \frac{۱۴}{۹} \times (\underbrace{\sin^۲\alpha + \cos^۲\alpha}_{۱} + ۲\underbrace{\sin\alpha\cos\alpha}_{-۱/۳}) = \frac{۱۴}{۹} \times \frac{۱}{۲} = \frac{۱۷}{۲۷}$$

$$\text{طرفین} ۱ \rightarrow \frac{۲۷}{۱۴} \xrightarrow{\times} \frac{۳\sqrt{۳}}{۲}$$