تکلیف شماره ۲۸ عربشیا ریاضی یازدهم سری B

۲۰ آفرین!

۱- (۲)

$\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} \Rightarrow \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow \sin\alpha > 0$ ربع اول یا دوم

$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha < 0$ ربع دوم یا سوم

پس ربع دوم

۲- (۲)

$-\frac{\pi}{12} < x < \frac{5\pi}{12} \Rightarrow -\frac{\pi}{6} < 2x < \frac{5\pi}{6} \Rightarrow -\frac{1}{2} < \sin 2x \leq 1$

$\Rightarrow -\frac{1}{2} < \frac{m-1}{2} \leq 1 \Rightarrow -2 < m-1 \leq 4 \Rightarrow -1 < m \leq 5$ ✓ گزینه (۱)

۳- (۲)

$\pi < 4x < 4\pi \Rightarrow \frac{\pi}{4} < x < \pi$

$\tan x + \cot x = -3 \Rightarrow \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = -3 \Rightarrow \frac{\sin^2 x + \cos^2 x}{\sin x \cos x} = -3$

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

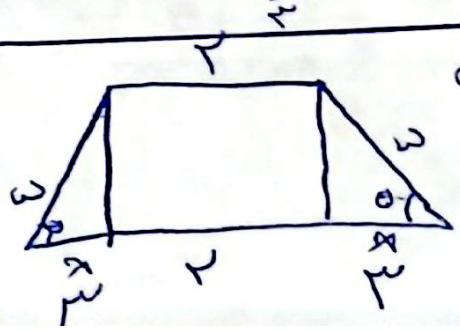
$(\sin x + \cos x)^2 = \sin^2 x + \cos^2 x + 2\sin x \cos x = 1 - \frac{2}{3} = \frac{1}{3} = (\sin x + \cos x)^2$

$\Rightarrow \sin x + \cos x = -\frac{\sqrt{3}}{3}$

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

$\Rightarrow \frac{1}{(-\frac{\sqrt{3}}{3})(1 + \frac{1}{3})} = -\frac{9}{4\sqrt{3}} = \boxed{-\frac{3\sqrt{3}}{4}}$ ✓

۴- (۲)



$\cos\theta = \frac{6}{10} \Rightarrow \frac{6}{10} = \frac{x}{5} \Rightarrow x = 3$

مساحت ذوزنقه $= \frac{(3+8)\times 4}{2} = \boxed{22}$ ✓

$$\tan\left(\frac{3\pi}{2}+\theta\right)\times\tan(\pi-\theta)-\left(\sin\left(\frac{7\pi}{2}+\theta\right)\times\cos\left(\frac{3\pi}{2}-\theta\right)\right)=k\cos^2\theta$$

$\frac{3\pi}{2}=270°$, $\pi=180°$, $\frac{7\pi}{2}+\frac{\pi}{2}=\frac{8\pi}{2}=4\pi=360°$

(٢)

$$\Rightarrow -\cot\theta\times\tan\theta-(\sin\theta\times-\sin\theta)=k\cos^2\theta$$

$$\Rightarrow -1+\sin^2\theta=k\cos^2\theta \Rightarrow -\underbrace{(1-\sin^2\theta)}_{\cos^2\theta}=k\cos^2\theta$$

$$\Rightarrow \boxed{k=-1}$$

٦- (٢)

$$\frac{\sqrt{2}x-\frac{\sqrt{2}}{2}}{\cos(135)} \times \underbrace{\sin\left(\frac{\pi}{4}-30\right)}_{-\cos 75} - \left(\sqrt{2}\times\frac{\sqrt{2}}{2}\times \underbrace{\cos(\pi-30)}_{-\cos 30}\right)$$

$$\Rightarrow \frac{\sqrt{2}}{2}\cos 75 + \cos 30 = \frac{\sqrt{2}}{2}\cos 75$$

$$\cos 75$$

$$\frac{\sqrt{2}}{2} = 1/\sqrt{2}$$

٧- (٢)

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

$$8\times 2\cos^2\left(\frac{\pi}{12}\right)\times\frac{3}{4}\times\frac{1}{2}\times\frac{1}{2}$$

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

$$\Rightarrow 8\times\left(\cos\left(\frac{\pi}{6}\right)+1\right)\times\frac{3}{16} = \frac{8}{2}\times\frac{\sqrt{3}+2}{8} = \frac{\sqrt{3}+4}{4}$$

$$1+\frac{\sqrt{3}}{2}$$

٨- (٢)

$$\frac{1-\sin x}{1+\sin x} = \frac{1}{3} \Rightarrow 1-\sin x = \frac{1}{3}+\frac{1}{3}\sin x \Rightarrow \frac{2}{3} = \frac{4}{3}\sin x \Rightarrow \sin x = \frac{1}{2}$$

$$\cos^2 x = 1-\sin^2 x = 1-\frac{1}{4} = \frac{3}{4} \Rightarrow \cos x = -\frac{\sqrt{3}}{2}$$

$$\tan\frac{x}{2} = \frac{\sin x}{1+\cos x} \Rightarrow \tan\frac{x}{2} = \frac{\frac{1}{2}}{1-\frac{\sqrt{3}}{2}} = \frac{1}{2-\sqrt{3}} = 2+\sqrt{3}$$

$$\frac{x}{2} = 75 \Rightarrow x = 150$$

٩- (٢)

$$\frac{\sin\theta}{1+\cos\theta} = \tan\frac{\theta}{2} \Rightarrow \frac{1+\cos\theta}{\sin\theta} = \cot\frac{\theta}{2}$$

$$\frac{1-\cos\theta}{\sin\theta} = \tan\frac{\theta}{2} \Rightarrow \frac{\sin\theta}{1-\cos\theta} = \cot\frac{\theta}{2}$$

$$\underbrace{\frac{\sin\theta}{1-\cos\theta}}_{\cot\frac{\theta}{2}} + \underbrace{\frac{1+\cos\theta}{\sin\theta}}_{\cot\frac{\theta}{2}} = k\cot\frac{\theta}{2} \Rightarrow \cot\frac{\theta}{2}+\cot\frac{\theta}{2} = k\cot\frac{\theta}{2}$$

$$\Rightarrow \boxed{k=2}$$

$1-\sin^2\alpha = \cos^2\alpha \Rightarrow 1-\frac{4}{100} = \cos^2\alpha \Rightarrow \cos\alpha = -\frac{\sqrt{96}}{100}$ -10

$\cos\left(\frac{17\pi+3\pi}{4}+\alpha\right) \Rightarrow \cos\left(4\pi+\frac{3\pi}{4}+\alpha\right) \Rightarrow \cos\left(\frac{3\pi}{4}+\alpha\right)$ (٢)

$= \cos\frac{3\pi}{4}\cos\alpha - \sin\frac{3\pi}{4}\sin\alpha \Rightarrow -\frac{\sqrt{2}}{2}\times -\frac{\sqrt{96}}{10} - \left(\frac{\sqrt{2}}{2}\times\frac{\sqrt{4}}{10}\right)$

فى ٢

$= \frac{\sqrt{2}\times\sqrt{3}}{20} - \frac{2}{20} = \frac{7}{10} - \frac{1}{10} = \boxed{0/9}$ ✓