تکلیف صفحه ۲۸ ۲۰

یازدهم دختر A نهاره مهرسوری

$$\frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \rightarrow \sin\alpha > 0$$

(۱) $\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}}$, $\frac{1}{\sqrt{\cos^2\alpha}} - \frac{1}{\cot\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|}$

$\cot > 0$

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

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

$\Rightarrow \sin\alpha > 0 , \cos\alpha > 0$ ناحیه اول

(۲) $\sin 2x = \frac{m-1}{4}$

$$\frac{-\pi}{12} < x < \frac{5\pi}{12}$$

$$\frac{-\pi}{6} < 2x < \frac{5\pi}{6}$$

$$\frac{-1}{2} < \sin 2x \leq 1$$

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

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

$$-1 < m \leq 5 \rightarrow m = (-1, 5]$$

(۳) $\tan x + \cot x = -3$, $3\pi < 4x < 4\pi$ $\Rightarrow |\cos\alpha| > |\sin\alpha|$

$$\frac{3\pi}{4} < x < \pi$$

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

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

موضوع: ______ تاریخ: / /

جواب

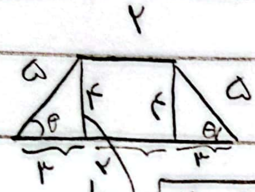
$$= \frac{1}{\frac{4}{3}(\sin x+\cos x)} = \frac{1}{\frac{4}{3}\times\frac{-1}{\sqrt{3}}} = -\frac{3\sqrt{3}}{4} = \boxed{-0{,}75\sqrt{3}}$$

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

$$|\sin x+\cos x| = \frac{1}{\sqrt{3}} \to \sin x+\cos x = \overset{\text{منفی}}{\pm}\frac{1}{\sqrt{3}} \Rightarrow \sin x+\cos x = \frac{-1}{\sqrt{3}}$$

$$|\cos x|>|\sin x|$$

۴)



$$\cos\theta = 0{,}6$$

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

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$$h = \sqrt{25-9} = \sqrt{16} = 4$$

$$S_{\text{ذوزنقه}} = \frac{(2+\text{قاعده بزرگ})\times 4}{2} = \frac{(2+8)\times 4}{2} = \frac{40}{2} = \boxed{20}$$

$$\text{قاعده بزرگ} = 3+2+3 = 8$$

۵)

$$\tan(\overset{270+15}{285}) \times \tan(\overset{-180+15}{-165^\circ}) - \sin(\overset{1080+15}{1095^\circ})\cos(\overset{270-15}{255^\circ}) = k\cos^2 15$$

$$-\cot 15 \times +\tan 15 - \sin 15 \times -\sin 15 = k\cos^2 15$$

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

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

۶)

$$A = \sqrt{3}\cos(210)\sin(\overset{270-27}{243}) - \sqrt{2}\sin(135)\cos(\overset{180-27}{153}) =$$

$$A = \sqrt{3}\times\frac{-\sqrt{3}}{2}\times -\cos 27 - \sqrt{2}\times\frac{\sqrt{2}}{2}\times -\cos 27 =$$

$$\frac{3}{2}\cos 27 + \cos 27 = \frac{5}{2}\cos 27$$

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$$\frac{A}{\cos 27^\circ} = \frac{\frac{5}{2}\cos 27^\circ}{\cos 27^\circ} = \boxed{\frac{5}{2}}$$

موضوع: تاریخ: / /

7) $f(x) = 16\cos^2(3x)\cos^2(6x)\cos^2(12x)\cos^2(24x)$

$f(\frac{\pi}{36}) =$

$= 16\left(\frac{1+\cos(6x)}{2}\right)\times\left(\frac{1+\cos(12x)}{2}\right)\times\frac{1+\cos(24x)}{2}\times\frac{1+\cos(48x)}{2}$

$= (1+\cos 6x)(1+\cos(12x))(1+\cos(24x))(1+\cos(48x)) =$

$f(\frac{\pi}{36}) = (1+\cos\frac{\pi}{6})(1+\cos\frac{\pi}{3})(1+\cos\frac{2\pi}{3})(1+\cos\frac{4\pi}{3})$

$= (1+\frac{\sqrt{3}}{2})(1+\frac{1}{2})(1-\frac{1}{2})(1-\frac{1}{2}) = \frac{3}{2}\times\frac{1}{2}\times\frac{1}{2}\times\frac{2+\sqrt{3}}{2}$

$\frac{3(2+\sqrt{3})}{16} = \frac{6+3\sqrt{3}}{16}$

8) $\frac{1-\sin x}{1+\sin x} = 4$ $\sin\alpha<0$

$\cos\alpha<0$

$4+4\sin x = 1-\sin x$

$5\sin x = -3 \longrightarrow \sin x = \frac{-3}{5}$

$\cos x = \frac{-4}{5}$

$\tan\frac{x}{2} = \frac{1-\cos x}{\sin x} = \frac{1+\frac{4}{5}}{\frac{-3}{5}} = \frac{\frac{9}{5}}{\frac{-3}{5}} = \frac{-9}{3} = \boxed{-3}$

9) $\frac{\sin\theta}{1-\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = \frac{2\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{2\sin^2\frac{\theta}{2}} + \frac{2\cos^2\frac{\theta}{2}}{2\sin\frac{\theta}{2}\cos\frac{\theta}{2}}$

$= \frac{\cos\frac{\theta}{2}}{\sin\frac{\theta}{2}} + \frac{\cos\frac{\theta}{2}}{\sin\frac{\theta}{2}} = \frac{2\cos\frac{\theta}{2}}{\sin\frac{\theta}{2}} = 2\cot\frac{\theta}{2} = k\cot\frac{\theta}{2}$

$\boxed{k=2}$

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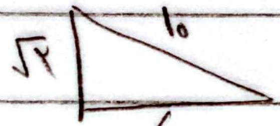
$\sin\alpha = \frac{\sqrt{2}}{10}$ $\cos\alpha < 0$

$\sin\alpha > 0$



$\sqrt{100-2} = \sqrt{98} = 7\sqrt{2}$

$\cos\alpha = -\frac{7\sqrt{2}}{10}$

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

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$\cos\left(\frac{11\pi}{4} + \alpha\right) = \cos\frac{11\pi}{4} \times \cos\alpha - \sin\frac{11\pi}{4} \times \sin\alpha$

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

$\frac{7 \times 2}{20} - \frac{2}{20} = \boxed{\frac{12}{20} = \frac{3}{5}}$