نام و نام خانوادگی ...محمد طاها کیانی...... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

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1

$\frac{\cos}{\sin} = \frac{\cos}{\sqrt{1-\cos^2}} \Rightarrow \frac{1}{\sin} = \frac{1}{|\sin|} \Rightarrow \sin = |\sin| \Rightarrow \sin > 0$

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

$\sin > 0 \ , \ \cos > 0 \Rightarrow$ در ربع اول

2

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

$-\frac{1}{2} < \frac{m-1}{4} \leq 1 \Rightarrow -2 < m-1 \leq 4 \Rightarrow -1 < m \leq 5$

3

$\frac{\sin}{\cos} + \frac{\cos}{\sin} = -3 \qquad \frac{\sin^2+\cos^2}{\cos \sin} = -3 \Rightarrow \frac{1}{\cos \sin} = -3 \Rightarrow \cos \times \sin = -\frac{1}{3}$

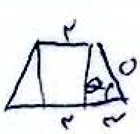
$(\sin+\cos)^3 = \sin^3 + 3\cos\sin^2 + 3\cos^2\sin + \cos^3 = \sin^3 + 3\cos\sin(\sin+\cos) + \cos^3$

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

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

$\frac{1}{\sin^3+\cos^3} = \frac{1}{-\frac{4}{3\sqrt{3}}} = -\frac{3\sqrt{3}}{4}$

4



$\frac{6}{10} = \frac{3}{l} \Rightarrow l = 5 \qquad 5^2 - 3^2 = h^2 \Rightarrow h = 4$

$2 + 2\times3 = 8 \qquad 8+2 = 10 \qquad \frac{10\times4}{2} = 20$

سوال ۴

$\tan(280°) = \tan(270°+10) = -\cot(10)$

$\tan(-190) = -\tan(190) = -\tan(180-10) = \tan(10)$

$\sin(1090) = \sin(3 \times 360 + 10) = \sin(10)$

$\cos(250°) = \cos(270-10) = -\sin(10)$

$-\cot(10) \times \tan(10) - \sin(10) \times -\sin(10) = -1 + \sin^2(10)$

$\sin^2(10) - 1 = \cos^2(10)$ $\quad k\cos^2(10) = \cos^2(10) \rightarrow k = 1$

$\sqrt{3}\cos(30) + \sin(270 - 30) - \sqrt{2}\sin(135)\cos(180 - 30)$ $\sqrt{3}(-\frac{\sqrt{3}}{2}) \ldots - \cos(30) - \sqrt{2}(\frac{\sqrt{2}}{2}) - \cos(30)$ $\frac{3}{2}\cos(30) + \cos(30) \to \frac{5}{2}\cos(30) \to \frac{\frac{5}{2}\cos(30)}{\cos(30)} = \frac{5}{2}$	6
$f(\frac{\pi}{24}) \to 16\cos^2(\frac{\pi}{24})\cos^2(\frac{\pi}{12})\cos^2(\frac{\pi}{6})\cos^2(\frac{\pi}{3})$ $\cos(\frac{\pi}{6}) = \cos^2\frac{\pi}{12} - \sin^2(\frac{\pi}{12}) \to 2\cos^2\frac{\pi}{12} - 1 + \cos^2\frac{\pi}{12} \Rightarrow \frac{\sqrt{3}}{2} + 1 = 2\cos^2\frac{\pi}{12}$ $(2\sqrt{3}+8) \times \frac{3}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{3\sqrt{3}+6}{16}$ $2\sqrt{3} + 8 = 16\cos^2\frac{\pi}{24}$	7
$\frac{1-\sin x}{1+\sin x} \times \frac{1-\sin x}{1-\sin x} = \frac{(1-\sin x)^2}{\cos^2 x} = 4 \to \frac{1-\sin x}{\cos x} = -2$ $1 - \sin x = -2\cos x \to 1 + 2\cos x = \sin x$ $\sin^2 x + \cos^2 x = 1 \Rightarrow 1 + 4\cos^2 x + 4\cos x + \cos^2 x = 1$ $5\cos^2 x + 4\cos x = 0 \quad \cos x(5\cos x + 4) = 0 \quad \begin{cases} \cos x = 0 \ \times \\ \cos x = -\frac{4}{5} \ \checkmark \end{cases}$ $\cos x = \cos^2\frac{x}{2} - \sin^2\frac{x}{2} \to -\frac{4}{5} = \cos^2\frac{x}{2} - \sin^2\frac{x}{2}$ $1 = \cos^2\frac{x}{2} + \sin^2\frac{x}{2}$ } $\cos^2\frac{x}{2} = \frac{1}{10} \to \cos\frac{x}{2} = -\frac{1}{\sqrt{10}}$ $\sin\frac{x}{2} = \frac{3}{\sqrt{10}}$ $\tan\frac{x}{2} = \frac{\frac{3}{\sqrt{10}}}{-\frac{1}{\sqrt{10}}} = -3$	8
$\frac{\sin x}{1-\cos x} + \frac{1+\cos x}{\sin x} \Rightarrow \frac{\sin x(1+\cos x)}{\sin^2 x} + \frac{\sin x(1+\cos x)}{\sin^2 x} = \frac{2\sin x(1+\cos x)}{\sin^2 x} \Rightarrow \frac{2(1+\cos x)}{\sin x}$ $\frac{2(1+\cos^2\frac{\theta}{2} - \sin^2\frac{\theta}{2})}{2\sin\frac{\theta}{2}\cos\frac{\theta}{2}} = \frac{\cos^2\frac{\theta}{2} + \sin^2\frac{\theta}{2} + \cos^2\frac{\theta}{2} - \sin^2\frac{\theta}{2}}{\sin\frac{\theta}{2}\cos\frac{\theta}{2}} = \frac{2\cos^2\frac{\theta}{2}}{\sin\frac{\theta}{2}\cos\frac{\theta}{2}} = \frac{2\cos\frac{\theta}{2}}{\sin\frac{\theta}{2}} = 2\cot\frac{\theta}{2}$	9
$\cos(\frac{11\pi}{4} + \alpha) = \cos(\frac{3\pi}{4} + \alpha) = \cos\frac{3\pi}{4}\cos\alpha - \sin\frac{3\pi}{4}\sin\alpha \Rightarrow -\frac{14}{20} - \frac{2}{20}$ $-\frac{\sqrt{2}}{2} \quad \frac{\sqrt{98}}{10} \quad \frac{\sqrt{2}}{2} \quad \frac{\sqrt{2}}{10}$ $\frac{2}{100} + \cos^2 = 1 \to \cos^2 = \frac{98}{100} = \cos = \frac{\sqrt{98}}{10}$ $\cos = -\frac{16}{20}$ $\cos = -\frac{4}{5}$	10