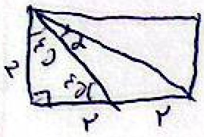
نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

۱

$\frac{1}{2} \times \sqrt{3} \times 6 \times \sin\alpha = 4.5 \to \sin\alpha = \frac{4.5}{3\sqrt{3}}$ $\quad \frac{4.5}{3\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{4.5\sqrt{3}}{9} = \frac{\sqrt{3}}{2}$

$\sin\alpha = \frac{\sqrt{3}}{2} \begin{cases} \alpha = 60^\circ \\ \alpha = 120^\circ \end{cases}$ $\quad \frac{120}{60} = 2$

۲

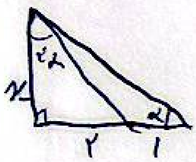


$\tan\beta = \frac{2}{2} = 1 \to \beta = 45^\circ$ $\quad \to \tan\alpha = \frac{1}{3} \Rightarrow \cot\alpha = 3$

$\tan(\alpha + 45) = \frac{4}{2} = 2$ $\quad \tan(\alpha+45) = \frac{\tan\alpha + \tan 45}{1 - \tan\alpha \tan 45}$

$\frac{\tan\alpha + 1}{1 - \tan\alpha} = 2 \to \tan\alpha + 1 = 2 - 2\tan\alpha \to 3\tan\alpha = 1 \to \tan\alpha = \frac{1}{3}$

۳

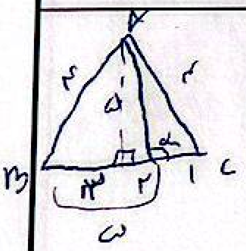


$\tan(2\alpha) = \frac{3}{x}$ $\quad \tan\alpha = \frac{x}{3}$ $\quad \tan\alpha = \frac{\frac{3}{2}}{3} = \frac{1}{2} \to \cot\alpha = \frac{1}{\tan\alpha} = 2$

$\tan(2\alpha) = \tan(\alpha+\alpha) = \frac{\tan\alpha + \tan\alpha}{1 - \tan\alpha \tan\alpha} = \frac{2\tan\alpha}{1 - \tan^2\alpha} = \frac{3}{x}$

$\frac{\frac{2x}{3}}{1 - \frac{x^2}{9}} = \frac{3}{x} \to 9 - \frac{3x^2}{9} = \frac{2x^2}{3} \to 18 - 3x^2 = 6x^2 \to 8x^2 = 18 \to x^2 = \frac{18}{8} \to x = \sqrt{\frac{18}{8}} = \sqrt{\frac{9}{4}} = \frac{3}{2}$

۴



$\tan(180 - \alpha) = \frac{5}{2} = 2.5$ $\quad \tan(180 - \alpha) = \frac{\tan 180 - \tan\alpha}{1 + \tan 180 \tan\alpha}$

$\tan(180) = \frac{0}{1} = 0$ $\quad \frac{0 - \tan\alpha}{1 + 0} = \frac{5}{2} \to \tan\alpha = -\frac{5}{2}$

۵

$\sin^2 + \cos^2 + \sin^2 = \frac{4}{3} \to 1 + \sin^2 = \frac{4}{3} \to \sin^2 = \frac{1}{3}$

$\sin^2 + \cos^2 = 1 \to \frac{1}{3} + \cos^2 = 1 \to \cos^2 = \frac{2}{3}$ $\quad \tan^2\alpha = \frac{\sin^2\alpha}{\cos^2\alpha} = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$

$\sin^4 + 4\cos^2 = (1-\cos^2)^2 + 4\cos^2 \Rightarrow 1+\cos^4 - 2\cos^2 + 4\cos^2 = 1+\cos^4 + 2\cos^2 = (1+\cos^2)^2$ ۶

$\cos^4 + 4\sin^2 = (1-\sin^2)^2 + 4\sin^2 \Rightarrow 1+\sin^4 - 2\sin^2 + 4\sin^2 = 1+\sin^4 + 2\sin^2 = (1+\sin^2)^2$

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

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

$\cos(\alpha) \times -\sin(\alpha) + \cot(\alpha)$

$3^2 + 4^2 = 25 \Rightarrow x = 5 \quad \sin\alpha = -\frac{4}{5} \quad \cos = -\frac{3}{5} \Rightarrow -\frac{3}{5} \times \frac{4}{5} + \frac{3}{4} = -\frac{12}{25} + \frac{3}{4} \Rightarrow \frac{-48+75}{100} = \frac{27}{100}$ ۷

$\sqrt{2}\sin x - \sqrt{2}\cos x = \sqrt{2}(\sin x - \cos x) = \sqrt{2}(\sqrt{2}\sin(x - \frac{\pi}{4})) \Rightarrow$

$\Rightarrow 2\sin(\frac{\pi}{12} - \frac{\pi}{4}) = 2\sin(\frac{-2\pi}{12}) = 2\sin(-\frac{\pi}{6}) = -1$ ۸

$4 \times \frac{\pi}{12} = \frac{\pi}{3} \quad \cos(\frac{\pi}{3}) = \frac{1}{2} \quad 3 \times \frac{1}{2} = \frac{3}{2} \quad \frac{3}{2} - 1 = \frac{1}{2}$

$\tan(\alpha) = \frac{\tan(\frac{\alpha}{2}) + \tan(\frac{\alpha}{2})}{1 - \tan\frac{\alpha}{2} \cdot \tan\frac{\alpha}{2}} = \frac{\frac{1}{4}+\frac{1}{4}}{1 - \frac{1}{4} \times \frac{1}{4}} = \frac{\frac{1}{2}}{\frac{15}{16}} = \frac{8}{15}$

$\sqrt{289} = 17 \quad 8^2 + 15^2 = 289$

$\sin = \frac{8}{17} \quad \cos = \frac{15}{17} \quad \frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{15}{17}} = \frac{\frac{8\times17 - 8\times15}{15\times17}}{-\frac{7}{17}} = \frac{\frac{16}{15\times17}}{-\frac{7}{17}} = \frac{16}{15\times17} \times \frac{17}{-7} = -\frac{16}{15\times7}$ ۹

$0 < \frac{\frac{\cos}{\sin}}{\sin} \Rightarrow 0 < \frac{\cos}{\sin^2} \Rightarrow \cos > 0 \qquad \cos > 0 \quad \sin < 0$ → ربع چهارم

$\rightarrow \sin < 0$ ۱۰

$\sin 2\alpha = 2\sin\alpha\cos\alpha \qquad 2\sin < 2\sin\alpha\cos\alpha \rightarrow \sin < \sin\cos$

$+ \quad + \quad +$

$- \quad - \quad +$