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

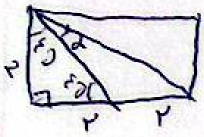
۱۸

۱ (۲)

$\frac{1}{2}\times\sqrt{3}\times 6\times\sin\alpha = 4/5 \rightarrow \sin\alpha = \frac{4/5}{3\sqrt{3}}$, $\frac{4/5}{3\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}} = \frac{4/5\sqrt{3}}{9} = \frac{\sqrt{3}}{2}$

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

۲ (۲)

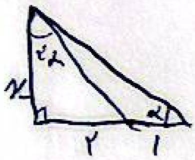


$\tan\beta = \frac{2}{2} = 1 \rightarrow \beta = 45^\circ$ $\rightarrow \tan\alpha = \frac{1}{3} \Rightarrow \cot\alpha = 3$ ✓

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

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

۳ (۲) ✓ (۲)

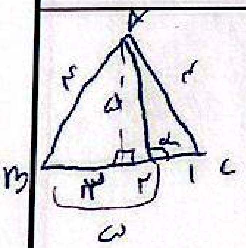


$\tan(2\alpha) = \frac{3}{x}$ $\tan\alpha = \frac{x}{3}$ | $\tan\alpha = \frac{\frac{3}{2}}{3} = \frac{1}{2} \rightarrow \cot\alpha = \frac{1}{\tan\alpha} = 2$

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

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

۴ ۰



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

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

۵ (۲)

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

$\sin^2+\cos^2 = 1 \rightarrow \frac{1}{3}+\cos^2 = 1 \rightarrow \cos^2 = \frac{2}{3}$ $\tan^2\alpha = \frac{\sin^2\alpha}{\cos^2\alpha} = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$ ✓

$\sin^4 + 4\cos^2 = (1-\cos^2)^2 + 4\cos^2 \Rightarrow 1+\cos^4 - 2\cos^2 + 4\cos^2 = 1+\cos^4 + 2\cos^2 = (1+\cos^2)^2$ $\cos^4 + 4\sin^2 = (1-\sin^2)^2 + 4\sin^2 \Rightarrow 1+\sin^4 - 2\sin^2 + 4\sin^2 = 1+\sin^4 + 2\sin^2 = (1+\sin^2)^2$ $\frac{(1+\cos^2)^2}{1+\cos^2} - \frac{(1+\sin^2)^2}{1+\sin^2} = 1+\cos^2 - 1 - \sin^2 = \cos^2 - \sin^2 = 1-\sin^2-\sin^2 = 1-2\sin^2$ ✓	۶	(۲)
$\sin(\frac{3\pi}{2}+\alpha)\cos(\frac{5\pi}{2}+\alpha) - \tan(\frac{3\pi}{2}+\alpha) =$ $\cos(\alpha) \times -\sin(\alpha) + \cot(\alpha)$ $3^2+4^2=25 \Rightarrow 5\times5=5$ $\sin\alpha = -\frac{4}{5}$, $\cos = -\frac{3}{5}$ $\Rightarrow -\frac{3}{5}\times\frac{4}{5} + \frac{3}{4} = -\frac{12}{25} + \frac{3}{4} \Rightarrow \frac{-48+75}{100} = \frac{27}{100}$ ✓	۷	(۲)
$\sqrt{2}\sin x - \sqrt{2}\cos x = \sqrt{2}(\sin x - \cos x) = \sqrt{2}(\sqrt{2}\sin(x-\frac{\pi}{4})) \Rightarrow$ $\Rightarrow 2\sin(\frac{\pi}{12}-\frac{\pi}{4}) = 2\sin(\frac{-2\pi}{12}) = 2\sin(-\frac{\pi}{6}) = -1$ $4\times\frac{\pi}{12} = \frac{\pi}{3}$ $\cos(\frac{\pi}{3}) = \frac{1}{2}$ $3\times\frac{1}{2} = \frac{3}{2}$ $\frac{3}{2} + -1 = \frac{1}{2}$ ✓	۸	(۲)
$\tan(\alpha) = \frac{\tan(\frac{\alpha}{2}) + \tan(\frac{\alpha}{2})}{1-\tan\frac{\alpha}{2}\cdot\tan\frac{\alpha}{2}} = \frac{\frac14+\frac14}{1-\frac14\times\frac14} = \frac{\frac12}{\frac{15}{16}} = \frac{8}{15}$ $\sqrt{289} = 17$ $8^2+15^2 = 289$ $\sin = \frac{8}{17}$ $\cos = \frac{15}{17}$ $\frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}} = \frac{\frac{8\times17-8\times15}{15\times17}}{-\frac{7}{17}} = \frac{16}{15\times17}\times\frac{17}{-7} = -\frac{16}{15\times7}$ ✓	۹	(۲)
$0 < \frac{\cos}{\frac{\sin}{\sin}} \Rightarrow 0 < \frac{\cos}{\sin^2} \Rightarrow \cos > 0$ $\cos > 0$, $\sin < 0$  → α ربع چهارم ✓ $\rightarrow \sin < 0$ $\sin 2\alpha = 2\sin\alpha\cos\alpha$ $2\sin < 2\sin\alpha\cos\alpha \rightarrow \sin < \sin\cos$ + + + − − +	۱۰	(۲)

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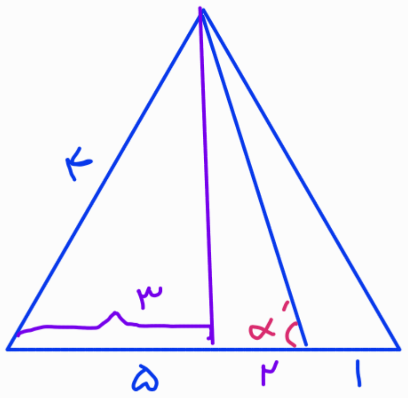

$$h = \sqrt{16 - 9} = \sqrt{7}$$

$$\tan \alpha' = \frac{\sqrt{7}}{2}$$

$$\tan \alpha = -\tan \alpha' = -\frac{\sqrt{7}}{2}$$