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

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$S = \frac{1}{2} \times 4 \times \sqrt{5} \times \sin\alpha = \frac{9}{4} \rightarrow \sin\alpha = \frac{\sqrt{5}}{5}$

$\rightarrow \alpha = \frac{\pi}{3}, \frac{2\pi}{3} \rightarrow$ (غ ق ق)

۲

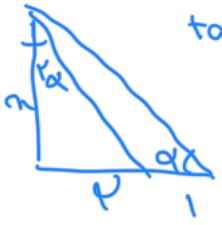
$\alpha + a + b = 90 \rightarrow \alpha = 90 - (a+b)$

$\tan a = \frac{2}{2} = 1 \quad , \quad \tan b = \frac{1}{2}$

$\cot\alpha = \cot\left(\frac{\pi}{2} - (a+b)\right) = \tan(a+b) = \frac{\tan a + \tan b}{1 - \tan a \cdot \tan b}$

$= \frac{3}{\frac{1}{2}}$ (۳)

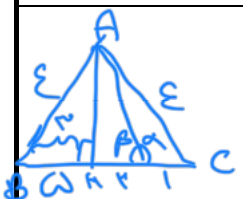
۳



$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} \rightarrow \frac{2}{x} = \frac{\frac{2x}{2}}{1-\frac{x^2}{4}} = \frac{2x}{4-x^2} \rightarrow \frac{1}{x} = \frac{x}{4-x^2}$ (۲)

$x^2 = 4 - x^2 \rightarrow x = \sqrt{2} \quad \cot\alpha = \frac{x}{2} = \frac{\sqrt{2}}{2}$ (۲)

۴



$\triangle AHC : 9 + AH^2 = 16 \rightarrow AH = \sqrt{7}$

$\tan\alpha = -\tan(\beta) = -\tan(180 - \alpha) = \frac{-\sqrt{7}}{3}$ (۲)

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$\sin^2 x + \sin^2 2x + \cos^2 2x = \frac{5}{4} \rightarrow \sin^2 x = \frac{1}{4} \rightarrow \cos^2 x = 1 - \frac{1}{4} = \frac{3}{4}$

$\tan^2 x = \frac{\frac{1}{4}}{\frac{3}{4}} = \frac{1}{3}$ (۲)

$\frac{\sin^4\alpha+4\cos^2\alpha}{1+\cos^2\alpha} = \frac{\sin^4\alpha+4-4\sin^2\alpha}{1+1-\sin^2\alpha} = \frac{(2-\sin^2\alpha)^2}{2-\sin^2\alpha} = 2-\sin^2\alpha$ $\frac{\cos^4+4\sin^2\alpha}{1+\sin^2\alpha} = \frac{\cos^4\alpha+4-4\cos^2\alpha}{1+1-\cos^2\alpha} = \frac{(2-\cos^2\alpha)^2}{2-\cos^2\alpha} = 2-\cos^2\alpha$ (د) $2-\sin^2\alpha-2+\cos^2\alpha = \cos^2\alpha-\sin^2\alpha = \cos 2\alpha$	۶
$+\cos\alpha \times -\sin\alpha - (-\cot\alpha) = -\frac{3}{5}\times\frac{4}{5}+\frac{3}{4} = 0/27$ $1+\tan^2 = \frac{1}{\cos^2}$ $\to \cos\alpha = \frac{3}{5}$, $\sin\alpha = \sqrt{1-\cos^2\alpha} = \frac{4}{5}$ (ج)	۷
$\sin x-\cos x = \sqrt{2}\sin(x-\frac{\pi}{4})$ $\sqrt{2}(\sin x-\cos x) = \sqrt{2}\times\sqrt{2}\times\sin(\frac{\pi}{12}-\frac{\pi}{4}) = 2\times\sin(-\frac{\pi}{6}) = -1$ (د) $3\cos(4\times\frac{\pi}{12}) = 3\cos(\frac{\pi}{3}) = \frac{3}{2} \to \frac{3}{2}-1 = \frac{1}{2}$	۸
$\sin\alpha = \frac{2\times\tan(\frac{\alpha}{2})}{1+\tan^2(\frac{\alpha}{2})} = \frac{\frac{1}{2}}{\frac{17}{16}} = \frac{8}{17}$, $\cos\alpha = \frac{1+\tan^2(\frac{\alpha}{2})}{1+\tan^2(\frac{\alpha}{2})} = \frac{\frac{15}{16}}{\frac{17}{16}} = \frac{15}{17}$ (د) $\tan\alpha = \frac{\frac{8}{17}}{\frac{15}{17}} = \frac{8}{15} \to \frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha} = \frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}} = \frac{\frac{16}{255}}{-\frac{7}{17}} = \frac{-16}{105}$	۹
$\sin 2\alpha = 2\sin\alpha\cos\alpha \to 2\sin\alpha < 2\sin\alpha\cos\alpha \xrightarrow{\sin\alpha>0} \cos\alpha > 1$ - ن ق غ $\sin\alpha<0$, $\cos 150$ (1) $\frac{\cot\alpha}{\sin\alpha} = \frac{\cos>0}{\sin^2\alpha} \to \cos\alpha>0$ (2) (د) (1), (2) → ربع	۱۰