نام و نام خانوادگی میلاد ..... پاسخنامه تشریحی تکلیف شماره ۱۰۲۷ کلاس یازدهم ..... B .....

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$S = 4,8$

$S = \frac{1}{2}ab\sin\alpha \Rightarrow \frac{9\sqrt{3}}{2} \times \sin\alpha = 4,8 \Rightarrow 9\sqrt{3}\sin\alpha = 9 \Rightarrow \sin\alpha = \frac{3}{4\sqrt{3}} = \frac{\sqrt{3}}{2} \Rightarrow \alpha = 60, 120$

$\frac{\alpha_{max}}{\alpha_{min}} = \frac{120}{60} = \boxed{2}$

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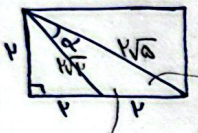

$2 = \sqrt{8 + 20 - 8\sqrt{10}\cos\alpha} \Rightarrow 4 = 28 - 8\sqrt{10}\cos\alpha \Rightarrow 8\sqrt{10}\cos\alpha = 24 \Rightarrow \cos\alpha = \frac{3}{\sqrt{10}}$

$S = 2$ $\quad 2 = \frac{1}{2} \times 2\sqrt{2} \times 2\sqrt{5} \times \sin\alpha \Rightarrow \sin\alpha = \frac{1}{\sqrt{10}}$ $\quad \cot\alpha = \boxed{3}$

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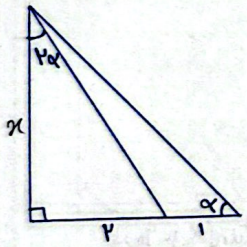
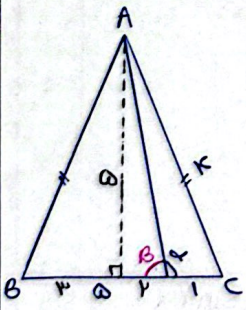


$\tan 2\alpha = \frac{2}{x}$ $\quad \tan\alpha = \frac{x}{3}$

$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} \Rightarrow \frac{2}{x} = \frac{2\left(\frac{x}{3}\right)}{1-\frac{x^2}{9}} = \frac{6x}{9-x^2} \Rightarrow 18 - 2x^2 = 6x^2 \Rightarrow x^2 = \frac{18}{8} = \frac{9}{4}$

$\Rightarrow x = \pm\frac{3}{2}$ (رد، زیرا α زاویه حاده) $\Rightarrow \tan\alpha = \frac{1}{2} \Rightarrow \boxed{\cot\alpha = 2}$

۴



$\tan\alpha = ?$

$\tan\beta = \frac{5}{2} \Rightarrow \tan\alpha = \boxed{-\frac{5}{2}}$

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$2\sin^2 x + \cos^2 x = \frac{4}{3}$ $\quad \tan^2 x = ?$

$\frac{\text{تقسیم بر}}{\cos^2 x} \Rightarrow 2\tan^2 x + 1 = \frac{\frac{4}{3}}{\cos^2 x} = \frac{4}{3}(1+\tan^2 x) \Rightarrow 2\tan^2 x - \frac{4}{3}\tan^2 x = \frac{4}{3} - 1 \Rightarrow \frac{2}{3}\tan^2 x = \frac{1}{3} \Rightarrow \tan^2 x = \boxed{\frac{1}{2}}$

۶

$$\frac{\sin^4\alpha+4\cos^2\alpha}{1+\cos^2\alpha}-\frac{\cos^4\alpha+4\sin^2\alpha}{1+\sin^2\alpha} \qquad \sin^4\alpha+\cos^4\alpha=1-2\sin^2\alpha\cos^2\alpha$$

$$\frac{\sin^4\alpha+4\cos^2\alpha+\sin^2\alpha+4\cos^2\alpha\sin^2\alpha-\cos^4\alpha-4\sin^2\alpha-\cos^2\alpha-4\sin^2\alpha\cos^2\alpha}{1+\sin^2\alpha+\cos^2\alpha+\cos^2\alpha\sin^2\alpha}$$

$$\frac{(\sin^4\alpha-\cos^4\alpha)+4(\cos^2\alpha-\sin^2\alpha)+(\sin^2\alpha-\cos^2\alpha)}{1+\sin^2\alpha+\cos^2\alpha+\cos^2\alpha\sin^2\alpha} \rightarrow (\sin^2\alpha-\cos^2\alpha)(\sin^4\alpha+\sin^2\alpha\cos^2\alpha+\cos^4\alpha)$$

$$=\frac{(\sin^2\alpha-\cos^2\alpha)(1+\sin^2\alpha+\sin^2\alpha\cos^2\alpha+\cos^4\alpha-4)}{1+\sin^2\alpha+\cos^2\alpha+\cos^2\alpha\sin^2\alpha}$$

$$=\frac{(\sin^2\alpha-\cos^2\alpha)(-2-\sin^2\alpha\cos^2\alpha)}{2+\sin^2\alpha\cos^2\alpha}=\cos^2\alpha-\sin^2\alpha=\boxed{\cos2\alpha}$$

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$$\sin\left(\frac{9\pi}{2}+\alpha\right)\cos\left(\frac{7\pi}{2}-\alpha\right)-\tan\left(\alpha-\frac{3\pi}{2}\right)$$

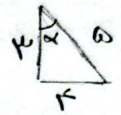
$$(+\cos\alpha)(-\sin\alpha)+\cot\alpha=$$

$$+\tan\left(\frac{3\pi}{2}-\alpha\right)$$

$$-\sin\alpha\cos\alpha+\cot\alpha$$

$$-\left(\frac{3}{5}\right)\left(-\frac{4}{5}\right)+\frac{3}{4}=-\frac{12}{5}+\frac{3}{4}=\boxed{-\frac{33}{20}}$$

اگر $\tan\alpha=\frac{4}{3}$، انتهای کمان α در ربع سوم است



$$\sin\alpha=\frac{4}{5}$$

$$\cos\alpha=\frac{3}{5}$$

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$$(4\cos^4x+\sqrt{2}\sin x-\sqrt{2}\cos x) \qquad x=\frac{\pi}{12}=15^\circ$$

$$4\cos^4x+\sqrt{2}(\sin x-\cos x)=\frac{3}{2}+2\sin(-45)=\frac{3}{2}-1=\boxed{\frac{1}{2}}$$

$$\sqrt{2}\sin\left(x-\frac{\pi}{4}\right)$$

$$15-45$$

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$$\tan\frac{\alpha}{2}=\frac{1}{4}$$

$$\frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha} \qquad \text{اگر } \tan\left(\frac{\alpha}{2}\right)=\frac{1}{4}$$

$$\tan\alpha=\frac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}}=\frac{\frac{1}{2}}{1-\frac{1}{16}}=\frac{\frac{1}{2}}{\frac{15}{16}}=\boxed{\frac{8}{15}}$$

۱۰

$$2\sin\alpha<2\sin\alpha\cos\alpha \qquad \sin2\alpha<2\sin\alpha \text{ ، انتهای کمان } \alpha \text{ در کدام ربع قرار دارد؟} \qquad 0<\frac{\cot\alpha}{\sin\alpha}$$

$$0<\frac{\cos\alpha}{\sin^2\alpha}\Rightarrow\boxed{\begin{matrix}\cos\alpha>0\\ \sin\alpha\neq0\end{matrix}}\Rightarrow \text{ربع اول}$$

$$\frac{\sin\alpha}{\sin\alpha}<\frac{\sin\alpha\cos\alpha}{\sin\alpha}\Rightarrow \text{if } \sin\alpha>0\Rightarrow 1<\cos\alpha \quad \text{غ ق ق}$$

$$\text{if } \sin\alpha<0\Rightarrow\boxed{-1>\cos\alpha} \quad \checkmark$$