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

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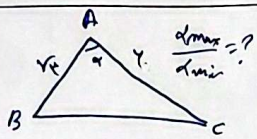

$S_{ABC}=\frac{1}{2}\times 4\times 6\times \sin\alpha = 6$

$\sin\alpha = \frac{6}{12}=\frac{\sqrt{3}}{2}$

$\alpha \begin{cases} 60^\circ \\ 120^\circ \end{cases}$

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

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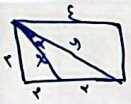

$x^2=2^2+2^2=8 \Rightarrow x=2\sqrt{2}$ (فیثاغورس)

$y^2+2^2=8 \Rightarrow y=2\sqrt{2}$

$S=\frac{1}{2}\times\sin\alpha\times 2\sqrt{2}\times 2\sqrt{2}=\frac{1}{2}\times 8$

$\sin\alpha=\frac{2}{2\sqrt{10}}=\frac{1}{\sqrt{10}}$

$\sin^2\alpha+\cos^2\alpha=1 \rightarrow \frac{1}{10}+\cos^2\alpha=1 \quad \cos^2\alpha=\frac{9}{10} \quad \cos\alpha=\frac{3}{\sqrt{10}}$

$\cot\alpha=\frac{\cos\alpha}{\sin\alpha}=\frac{3}{\sqrt{10}}\times\frac{\sqrt{10}}{1}=3$

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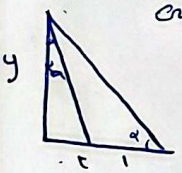

$\cot\alpha=\frac{3}{y}$

$\cot^2\alpha=\frac{\cot^2\alpha-1}{2\cot\alpha}=\frac{(\frac{3}{y})^2-1}{2\times\frac{3}{y}}=\frac{y}{6}$

$9-y^2=3y^2 \Longrightarrow y=3\sqrt{2}$

$\cot\alpha=3\times\frac{2}{3\sqrt{2}}=\sqrt{2}$

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$\sqrt{2}^2-2^2=x^2$

$x=\sqrt{7}$

$y=\sqrt{7}^2+2^2=\sqrt{11}$

$S=\sqrt{11}\times 1\times\sin\alpha\times\frac{1}{2}=\frac{\sqrt{7}}{2}$

$\sin\alpha=\frac{\sqrt{7}}{\sqrt{11}}$

$\sin^2\alpha+\cos^2\alpha=1$

$\frac{7}{11}+\cos^2\alpha=1 \quad \cos^2\alpha=\frac{4}{11} \quad \cos\alpha=\frac{2}{\sqrt{11}}$

$\tan\alpha=\frac{\sin\alpha}{\cos\alpha}=\frac{\frac{\sqrt{7}}{\sqrt{11}}}{\frac{2}{\sqrt{11}}}=\frac{\sqrt{7}}{2}$

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

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$\sin^2x+\sin^2x+\cos^2x=1$

$\sin^2x=\frac{1}{3} \quad \frac{2}{3}+\cos^2x=1 \quad \cos^2x=\frac{1}{3} \quad \tan^2x=\frac{\sin^2x}{\cos^2x}=\frac{1/3}{2/3}=\frac{1}{2}$

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

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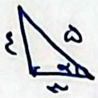
$+\cos\alpha(-\sin\alpha) - (-\cot\alpha)$



$-\frac{3}{5}\times\frac{4}{5} + \frac{3}{4} = \frac{27}{100}$

$\frac{12}{5} + \frac{3}{4} = \frac{63}{20}$

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$3\cos\frac{\pi}{3} + \sqrt{2}\sin\frac{\pi}{12} - \sqrt{2}\cos\frac{\pi}{12} \to \frac{3}{2} + \sqrt{2}(\sin 15 - \cos 15)$

$\sin 15 \to \sin(45-30) = \sin 45\cos 30 - \sin 30\cos 45 = \frac{\sqrt6}{4} - \frac{\sqrt2}{4} = \frac{\sqrt6-\sqrt2}{4}$

$\cos 15 \to \cos(45-30) = \sin 45\sin 30 - \cos 45\cos 30 = \frac{\sqrt2+\sqrt6}{4}$

$\frac{3}{2} + \sqrt2\left(\frac{\sqrt6-\sqrt2-\sqrt2-\sqrt6}{4}\right) = \frac{3}{2} + \sqrt2\left(\frac{-2\sqrt2}{4}\right) \Rightarrow \frac{3}{2} - \frac{2}{2} = \frac{1}{2}$

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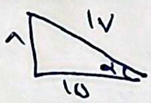
$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} \to \tan\alpha = \frac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}} = \frac{\frac12}{\frac{15}{16}} = \frac{8}{15}$



$\cos\alpha = \frac{15}{17}$ $\sin\alpha = \frac{8}{17}$

$\frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{15}{17}} = \frac{\frac{136-120}{255}}{\frac{7}{17}} = -\frac{16}{105}$

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$2\sin\alpha < 2\sin\alpha\cos\alpha \to$ $\sin\alpha < 0 \to \cos < 1$ ✓; $\sin\alpha > 0 \to \cos\alpha > 1$ α

$0 < \frac{\cot\alpha}{\sin\alpha}$ $0 < \cot\alpha$, $\sin\alpha$ ربع اول

$0 > \cot\alpha$, $\sin\alpha$ ربع چهارم ✓

$\frac{\cos\alpha < 0}{\sin\alpha}$ $\cos\alpha > 0$

ناحیه ۴

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