با عرض پوزش سوالات ۷ و ۸ جابجا نوشته شده اند

تکلیف شماره ۲۷ — یازدهم ریاضی B — ملیا فروتن — ۱۹٫۵

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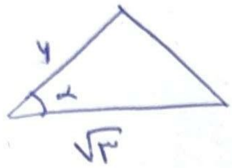

$S_\Delta = \frac{1}{2} ab\sin\alpha \to \frac{9}{2} = \frac{1}{2} \times \sqrt{6} \times \sqrt{3} \times \sin\alpha$

$\sin\alpha = \frac{\sqrt{3}}{2} \to \alpha \to 120° \to \max,\ \to 60° \to \min \Rightarrow \frac{120}{60} = \boxed{2}$

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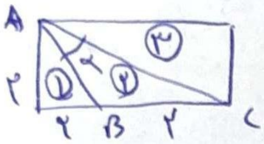

$AB = \sqrt{4+4} = 2\sqrt{2} \to AC = 2\sqrt{5}$

$S_{ABCD} = 4 \times 2 = 8$

$S_3 = 4,\ S_1 = 2 \to S_2 = 2$

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

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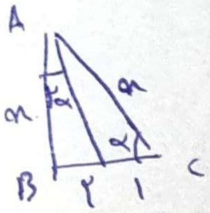

$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} = \frac{2}{x} \quad \tan\alpha = \frac{x}{3} \to$

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

$18 = 8x^2 \to x = \cancel{\frac{3}{2}}$

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

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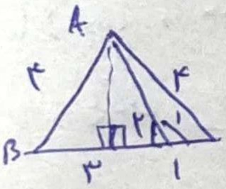

$AH \to$ ارتفاع و میانه $\to AH = \sqrt{16-9} = \sqrt{7}$

$\tan B = \frac{\sqrt{7}}{3} \to \tan\alpha = \tan(\pi - B) = -\tan B$

$\boxed{\tan\alpha = \frac{-\sqrt{7}}{3}}$

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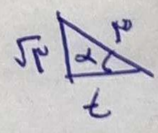
$\sin^2\alpha = \frac{1}{3} \to \sin\alpha = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3} \to$  $\to t = \sqrt{6} \to \tan\alpha = \frac{\sqrt{3}}{\sqrt{6}}$

$\boxed{\tan^2\alpha = \frac{3}{6} = \frac{1}{2}}$

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

$-\sin^2\alpha + 2 + \cos^2\alpha - 2 = \cos^2\alpha - \sin^2\alpha = \boxed{\cos 2\alpha}$

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$3\cos\frac{\pi}{3} + \sqrt{2}\left(\sin\frac{\pi}{12} - \cos\frac{\pi}{12}\right) = \frac{3}{2} + \sqrt{2}\left(\sqrt{2}\sin\left(\frac{\pi}{12}-\frac{\pi}{4}\right)\right) = \frac{3}{2} + 2\sin\left(-\frac{\pi}{6}\right)$

$= \frac{3}{2} - 1 = \boxed{\frac{1}{2}}$

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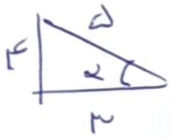

$\left.\begin{matrix}\sin \to \ominus \\ \cos \to \ominus\end{matrix}\right\} \to \cos\alpha \to (-\sin\alpha) + \cot\alpha = -\frac{3}{5}\left(\frac{4}{5}\right) + \frac{3}{4} =$

$\boxed{\frac{27}{100}}$

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$\tan^2\frac{\alpha}{2} = \frac{1}{16} = \frac{1-\cos\alpha}{1+\cos\alpha} \to 1+\cos\alpha = 16 - 16\cos\alpha$

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

$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{15}{17}} = \boxed{-\frac{16}{105}}$

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$\frac{\cos\alpha}{\sin^2\alpha} > 0 \to \cos\alpha > 0 \to$ ناحیه ۱ و ۴ ① $\to 2\sin\alpha < 2\sin\alpha\cos\alpha \to \cos\alpha > 1$

غلط $\to \sin\alpha > 0 \to$ ناحیه ۳ و ۴ ②

① $\cap$ ② $\to$ $\boxed{\text{ناحیه ۴}}$