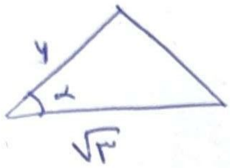
ملیکا فروتن — یازدهم ریاضی B — تکلیف شماره ۲۷

با عرض پوزش سوالات ۷ و ۸ جابه‌جا نوشته شده اند

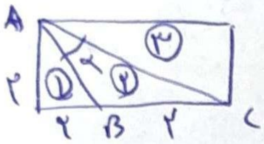
۱-



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

$\sin\alpha = \frac{\sqrt{3}}{2} \to \alpha \begin{cases} \to 120^\circ \to \max \\ \to 60^\circ \to \min \end{cases} \Rightarrow \frac{120}{60} = 2$

۲-



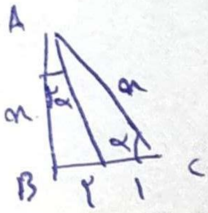
$AB = \sqrt{4+4} = 2\sqrt{2} \to AC = 2\sqrt{5}$

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

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

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

۳-

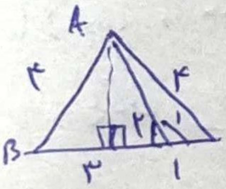


$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} = \frac{2}{x}\qquad \tan\alpha = \frac{x}{3} \to$

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

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

۴-

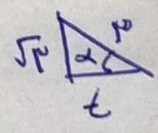


$AH \to$ ارتفاع و میانه $\to AH = \sqrt{16-9} = \sqrt{7}$

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

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

۵-

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

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

۶-

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

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

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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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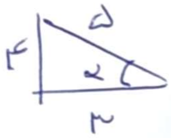

$$\left.\begin{matrix}\sin \to \ominus \\ \cos \to \ominus\end{matrix}\right\} \to \cos\alpha \to (-\sin\alpha)+\cot\alpha=\frac{-3}{5}\left(\frac{4}{5}\right)+\frac{3}{4}=\boxed{\frac{27}{100}}$$

-۹

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

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

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

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

$\to 2\sin\alpha<2\sin\alpha\cos\alpha \to \cos\alpha>1$

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

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