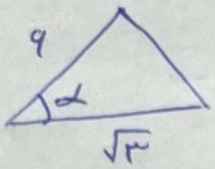
دانان فیزیک پایه دوازدهم A

-۱



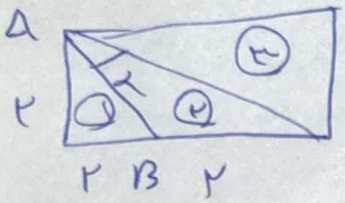
$S_{\triangle} = \frac{1}{2} ab\sin\alpha \rightarrow \frac{9}{2} = \frac{1}{2} \times \sqrt{9}\alpha\sqrt{3} \times \sin\alpha$ (۲)

$\sin\alpha = \frac{\sqrt{3}}{2} \rightarrow \alpha = \begin{matrix} 60 \\ \downarrow \\ \min \end{matrix}, 120 \rightarrow \max$

$\frac{120}{60} = \boxed{2}$ ✓

۱۹,۷۵

-۲



$AB = \sqrt{4^2+2^2} = 2\sqrt{5}$

$AC = 2\sqrt{10}$

(۲)

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

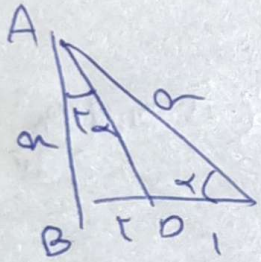
$S_3 = 4$ ⎫ $S_4 = 2$

$S_1 = 2$ ⎭

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

$\sin\alpha = \frac{1}{\sqrt{10}}$, $\boxed{\cot\alpha = 3}$ ✓

-۳



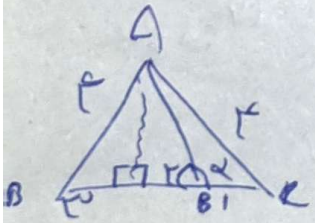
$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} = \frac{2}{x}$

۱,۷۵

$\tan\alpha = \frac{x}{2} \rightarrow \frac{2}{x} = \frac{2x}{1-\frac{x^2}{9}} = \frac{9x}{9-x^2}$

$18 - 2x^2 = 9x^2 \rightarrow 18 = 11x^2 \rightarrow \boxed{x = \frac{3}{2}}$ ✓

$\cot\alpha = \frac{3}{x} = \boxed{2}$



-۴

$AH = \text{ارتفاع} \rightarrow AH = \sqrt{19-9} = \sqrt{10}$

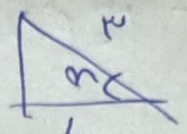
(۲)

$\tan\beta = \frac{\sqrt{10}}{2} \rightarrow \tan\alpha = \tan(\pi-\beta) = -\tan\beta$

$\tan\alpha = -\frac{\sqrt{10}}{2}$ ✓ ← منفی است

-۳

$\sin^2\alpha = \frac{1}{3} \rightarrow \sin\alpha = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3} \rightarrow$



(۲)

$t = \sqrt{4} \rightarrow \left(\tan\alpha = \frac{\sqrt{3}}{\sqrt{4}}\right)^2 \rightarrow \boxed{\tan^2\alpha = \frac{3}{4} = \frac{1}{3}}$ ✓

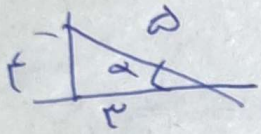
-۴

$$\frac{\sin^4\alpha + 4(1-\sin^2\alpha)}{1+(1-\sin^2\alpha)} - \frac{\cos^4\alpha + 4(1-\cos^2\alpha)}{1+(1-\cos^2\alpha)} =$$ (۲)

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

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

-۷



$\sin \rightarrow \ominus$
$\cos \rightarrow \ominus$ ۲ $\rightarrow \cos\alpha(-\sin\alpha) + \cot\alpha =$ (۲)

$$-\frac{3}{5}\left(\frac{4}{5}\right) + \frac{3}{4} = \boxed{\frac{27}{100}}$$ ✓

-۸

$$2\cos\frac{\pi}{3} + \sqrt{2}\left(\sin\frac{\pi}{12} - \cos\frac{5\pi}{12}\right) = \frac{2}{4} + \sqrt{2}\left(\sqrt{2}\sin\left(\frac{\pi}{12} - \frac{\pi}{4}\right)\right) =$$ (۲)

$$\frac{2}{4} + 2\sin\left(-\frac{\pi}{6}\right) = \frac{2}{4} - 1 = \boxed{\frac{1}{2}}$$ ✓

-۹

$$\left(\tan^2\frac{\alpha}{2}\right) = \frac{1}{14} = \frac{1-\cos\alpha}{1+\cos\alpha} \rightarrow 1+\cos\alpha = 14 - 14\cos\alpha$$ (۲)

$\cos\alpha = \frac{13}{15}$

$$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{13}{17}} = \boxed{\frac{14}{105}}$$ ✓

-۱۰ (۲)

$\frac{\cos\alpha}{\sin^2\alpha} > 0 \rightarrow \cos\alpha > 0$ → $2\sin\alpha < 2\sin\alpha\cos\alpha \rightarrow 1 < \cos\alpha$

ناحیه ۱ و ۴ — غیرقابق ← $\sin\alpha < 0$ ← ناحیه ۳ و ۴

$\boxed{\alpha}$ (ناحیه ۴) ✓