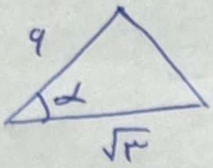
رایان معماریان   الف شماره ۲۷   یازدهم A

۱-

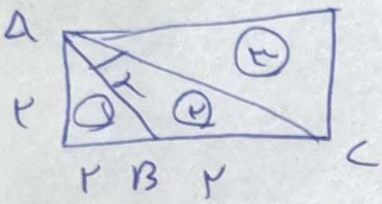


$S_\triangle = \frac{1}{2} ab\sin\alpha \to \frac{9}{2} = \frac{1}{2}\times\sqrt{6}\times\sqrt{3}\times\sin\alpha$

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

$\frac{120}{60} = \boxed{2}$

۲-



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

$AC = 2\sqrt{5}$

$S_{کل} = 4\times 2 = 8$

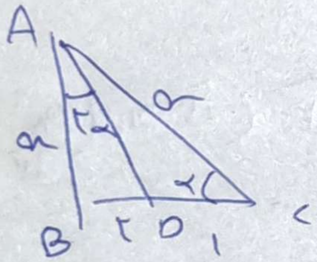
$S_3 = 4$ ، $S_2 = 2$

$S_1 = 2$

$2 = \frac{1}{2}\times 2\sqrt{5}\times 2\sqrt{2}\sin\alpha \to \sin\alpha = \frac{1}{\sqrt{10}}$

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

۳-

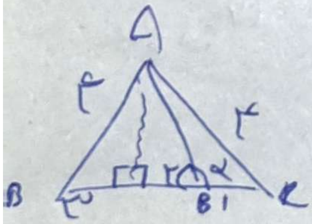


$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} = \frac{2}{x}$

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

$18 - 2x^2 = 6x^2 \to 18 = 8x^2 \to \boxed{x = \frac{3}{2}}$

۴-



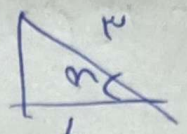
$AH =$ ارتفاع $\to AH = \sqrt{16-9} = \sqrt{7}$

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

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

-3

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



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

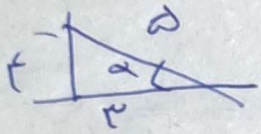
-4

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

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

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

-5



$\sin \rightarrow (-)$, $\cos \rightarrow (-)$ ثالث ربع $\rightarrow \cos\alpha(-\sin\alpha) + \cot\alpha =$

$-\frac{3}{5}\left(\frac{4}{5}\right) + \frac{3}{4} = \boxed{\frac{37}{100}}$

-6

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

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

-7

$\left(\tan^2\frac{\alpha}{2}\right) = \frac{1}{16} = \frac{1-\cos\alpha}{1+\cos\alpha} \rightarrow 1+\cos\alpha = 16 - 16\cos\alpha$

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

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

-8

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

$\rightarrow 2\sin\alpha < 2\sin\alpha\cos\alpha \rightarrow 1 < \cos\alpha$ غیق ق

$\sin\alpha < 0$ ناحیه ۳ یا ۴

$\boxed{\alpha}$ ناحیه ۴