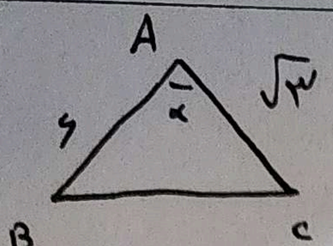
نام و نام خانوادگی ....امیرعلی مقصودی..... پاسخنامه تشریحی تکلیف شماره ...۲۷... کلاس ...یازدهم...پیش A.....

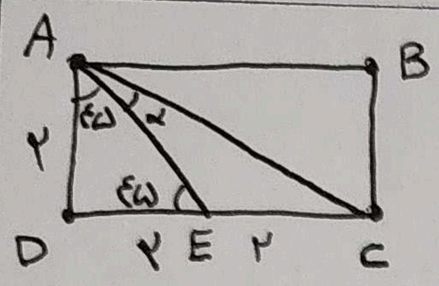
۲۰



$\xrightarrow{0<\alpha<180} \nearrow \frac{max}{min} = \frac{120}{60} = 2$ ✓

$S = \frac{1}{2} \times 6 \times \sqrt{3} \times \sin\alpha = 3\sqrt{3}\sin\alpha = 4/5 \Rightarrow \sin\alpha = \frac{4/5}{3\sqrt{3}} = \frac{\sqrt{3}}{2}$ ۱

(۲)

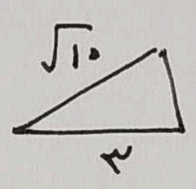


$AE = \sqrt{2^2+2^2} = 2\sqrt{2}$ $\quad AC = \sqrt{2^2+4^2} = 2\sqrt{5}$

$EC = \sqrt{a^2+b^2-2ab\cos\alpha} = \sqrt{28-8\sqrt{10}\cos\alpha} = \sqrt{4}$

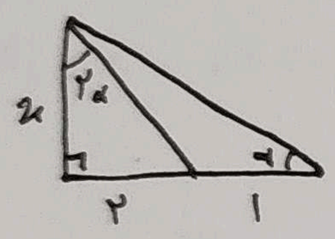
(۲)

$\Rightarrow 28-8\sqrt{10}\cos\alpha = 4 \rightarrow \cos\alpha = \frac{3}{\sqrt{10}}$



$\cot = \frac{3}{1} = 3$ ✓

۲



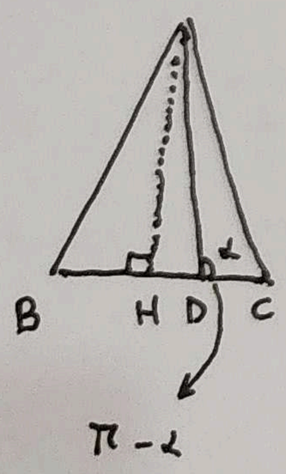
$\tan\alpha = \frac{x}{3}$ $\quad \cot 2\alpha = \frac{x}{2}$

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

(۲)

$1 - \frac{x^2}{9} = \frac{x^2}{4} \Rightarrow \frac{4x^2}{9} = 1 \Rightarrow x = \frac{3}{2} \Rightarrow \cot\alpha = \frac{3}{x} = 2$ ✓

۳



$AH = \sqrt{14-9} = \sqrt{5}$

$\tan(\pi-\alpha) = \frac{AH}{HD} = \frac{\sqrt{5}}{2}$

$\tan\alpha = -\tan(\pi-\alpha) = \boxed{\frac{-\sqrt{5}}{2}}$ ✓

(۲)

۴

$\sin^2 x + \sin^2 x + \cos^2 x = \frac{4}{3} \Rightarrow \frac{4}{3} - \frac{3}{3} = \sin^2 x$

$\frac{1}{3} + \cos^2 x = 1 \Rightarrow \cos^2 x = \frac{2}{3}$

$\tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$ ✓

(۲)

۵

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

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

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

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

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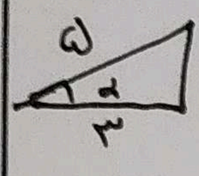

$\sin = \frac{-4}{5}$

$\cot = \frac{3}{4}$

$\cos = \frac{-3}{5}$

$\sin\left(\frac{9\pi}{2}+\alpha\right) = \cos\alpha = \frac{-3}{5}$

$\tan\left(\alpha - \frac{3\pi}{2}\right) = -\cot\alpha = \frac{-3}{4}$

$\sin\left(\frac{9\pi}{2}+\alpha\right)\cos\left(\frac{7\pi}{2}-\alpha\right) - \tan\left(\alpha - \frac{3\pi}{2}\right)$

$\cos\left(\frac{7\pi}{2}-\alpha\right) = -\sin\alpha = \frac{4}{5}$

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

۲ ۷

$4\cos 4x = 4\cos\frac{4\pi}{2} = 4\times\frac{1}{2} = 2$

$\sqrt{2}\sin x - \sqrt{2}\cos x = \sqrt{2}(\sin x - \cos x)$ $\xrightarrow{\text{به توان ۲}}$ $2(\sin^2 x + \cos^2 x - 2\sin x\cos x)$

$\Rightarrow = 2(1-\sin 2x)$

$= 2 - 2\sin\frac{\pi}{6} = 1 \Rightarrow \sqrt{2}\sin x - \sqrt{2}\cos x$ ↗ -1 ↘ 1 ✓

$\frac{2}{2} + (-1) = \frac{1}{2}$ ✓

۲ ۸

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

$\Rightarrow \sin^2\frac{\alpha}{2} + 16\sin^2\frac{\alpha}{2} = 1 \Rightarrow \sin\frac{\alpha}{2} = \frac{1}{\sqrt{17}}$

$\cos\alpha = \cos^2\frac{\alpha}{2} - \sin^2\frac{\alpha}{2} = \frac{15}{17}$

$\sin\alpha = 2\sin\frac{\alpha}{2}\cos\frac{\alpha}{2} = 2\times\frac{1}{\sqrt{17}}\times\frac{4}{\sqrt{17}} = \frac{4}{\sqrt{17}}$

$\Rightarrow \frac{\frac{4}{\sqrt{17}}}{\frac{15}{17}} = \frac{4}{15}$ ✓ $\quad \cos\frac{\alpha}{2} = \frac{1}{\sqrt{17}}$

۲ ۹

$\sin 2\alpha = 2\sin\alpha\cos\alpha \Rightarrow 2\sin < 2\sin\alpha\cos\alpha$

$\Rightarrow 2\sin\alpha\cos\alpha - 2\sin\alpha > 0$ $\quad 2\sin\alpha(\cos\alpha - 1) > 0 \Rightarrow \sin\alpha < 0$

$\cot\alpha < 0$

$\frac{\cot\alpha}{\sin\alpha} > 0$ ✓ ناحیه چهارم

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