نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۷ ... کلاس ... یازدهم .....

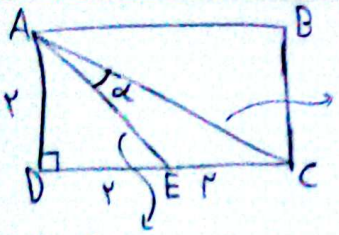
۲۵

۱ (۲)

$S = \frac{1}{2} \times \sqrt{2} \times 4 \times \sin\alpha = \frac{9}{4} \rightarrow \sin\alpha = \frac{3}{2\sqrt{3}} \times \frac{\sqrt{2}}{\sqrt{3}} = \frac{3\sqrt{6}}{6} = \frac{\sqrt{3}}{2}$

$\rightarrow \alpha \nearrow 120^\circ \rightarrow \frac{120^\circ}{60^\circ} = 2$ ✓

۲ (۲)



$y^2 = 2^2 + 4^2 = 4 + 16 = 20 \rightarrow y = 2\sqrt{5}$

$x^2 = 4 + 4 = 8 \rightarrow x = 2\sqrt{2}$

$S_{ADC} = \frac{2 \times 4}{2} = 4$

$S_{ADE} = \frac{2 \times 2}{2} = 2$

$\Rightarrow S_{AEC} = 2 \rightarrow \frac{1}{2} \times 2\sqrt{2} \times 2\sqrt{5} \times \sin\alpha$

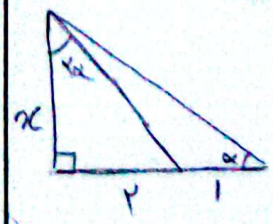
$4\sqrt{10} \times \sin\alpha = 4 \rightarrow \sin\alpha = \frac{1}{\sqrt{10}}$

$\rightarrow \cos\alpha = \frac{3}{\sqrt{10}}$

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

۳ (۲)

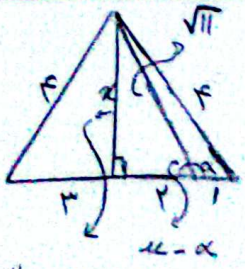
$\tan 2\alpha = \frac{2\tan\alpha}{1 - \tan^2\alpha} \rightarrow \frac{2}{x} = \frac{2(\frac{x}{3})}{1 - (\frac{x^2}{9})} \rightarrow 1 - \frac{x^2}{9} = \frac{x^2}{3}$



$\Rightarrow \frac{3x^2}{9} + \frac{x^2}{9} = 1 \Rightarrow \frac{4x^2}{9} = 1 \rightarrow x^2 = \frac{9}{4} \rightarrow x = \frac{3}{2}$

$\rightarrow \boxed{\cot\alpha = 2}$ ✓

۴ (۲)



$\tan(\pi - x) = -\tan x$

$\tan\alpha = -\frac{\sqrt{7}}{2}$ ✓

$3^2 + x^2 = 4^2$

$x^2 = 7 \rightarrow x = \sqrt{7}$

۵ (۲)

$\sin^2 x + \underbrace{\sin^2 x + \cos^2 x}_{1} = \frac{4}{3}$

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

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

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

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

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

$\cos^2\alpha+1-\sin^2\alpha-1 = \cos^2\alpha-\sin^2\alpha \Rightarrow \boxed{\cos 2\alpha}$ ✓

۶ (۲)

$\tan\alpha = \frac{4}{3} \rightarrow 1+\tan^2\alpha = \frac{1}{\cos^2\alpha} \rightarrow \cos^2\alpha = \frac{9}{25} \rightarrow \cos\alpha = -\frac{3}{5} \rightarrow \sin\alpha = -\frac{4}{5}$

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

$\sin(4\pi+\frac{\pi}{2}+\alpha) \times \cos(2\pi+\frac{\pi}{2}-\alpha) - \tan(\alpha-\frac{3\pi}{2}) =$

$\rightarrow \cos\alpha \times (-\sin\alpha) + \cot\alpha = \underbrace{(-\frac{3}{5})(\frac{4}{5})}_{-\frac{12}{25}} + \frac{3}{4} = \frac{-48+75}{100} = \boxed{\frac{27}{100}}$ ✓ پاسخ

۷ (۲)

$2\cos\frac{\pi}{3} + \underbrace{\sqrt{2}(\sin x - \cos x)}_{\sqrt{2}(\sqrt{2}\sin(x-\frac{\pi}{4}))} = 2\times\frac{1}{2} + 2\times(-\frac{1}{2}) = \frac{2}{2} - 1 = \boxed{\frac{1}{2}}$ ✓

$= 2\sin(-\frac{\pi}{6})$

$\frac{\pi}{12} - \frac{\pi}{4} = -\frac{\pi}{6}$

۸ (۲)

$\tan\alpha = \frac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}} = \frac{2\times\frac{1}{4}}{1-\frac{1}{16}} = \frac{\frac{1}{2}}{\frac{15}{16}} = \frac{8}{15} \rightarrow 1+\tan^2\alpha = \frac{1}{\cos^2\alpha} \rightarrow \frac{1}{\cos^2\alpha} = 1+\frac{64}{225} = \frac{289}{225}$

$\rightarrow \cos\alpha = \frac{15}{17} \rightarrow \sin\alpha = \frac{8}{17}$

$\frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}} = \boxed{-\frac{16}{105}}$ ✓

۹ (۲)

$\sin\alpha < 2\sin\alpha\cos\alpha \rightarrow \sin\alpha(\underbrace{1-\cos\alpha}_{\text{همواره مثبت}}) < 0 \rightarrow \sin\alpha < 0$

$\frac{\cot\alpha}{\sin\alpha} = \frac{\frac{\cos\alpha}{\sin\alpha}}{\sin\alpha} = \frac{\cos\alpha}{\sin^2\alpha} > 0 \rightarrow \cos > 0$

$\rightarrow$ ناحیه چهارم ✓

۱۰ (۲)