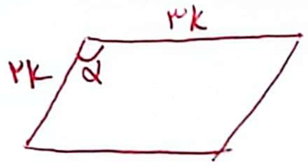
شهاب محقق تکلیف ۲۶ آبان دوشنبه دها

سوال ۱)

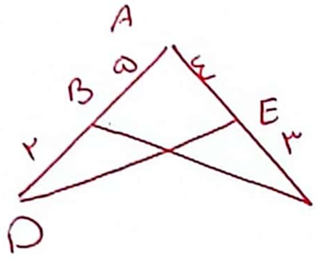


$S = (2k)(3k)\times \frac{1}{2}\times \sin\alpha = 54$

$6k^2 \times \frac{1}{2} = 54 \Rightarrow k^2 = 18 \Rightarrow k = 3\sqrt{2}$

محیط $= 2(2k+3k) = 10k = 10(3\sqrt{2}) = 30\sqrt{2}$

سوال ۲)

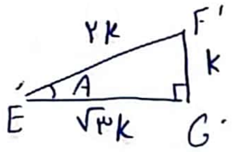


$|S_{A\hat{B}C} - S_{A\hat{D}E}| = 1/75 \qquad \tan\hat{A} = ?$

$S_{ABC} = \frac{1}{2} AB \times AC \times \sin\hat{A} = \frac{1}{2}\times 5\times 7\times \sin\hat{A} = \frac{35}{2}\sin\hat{A}$

$S_{A\hat{D}E} = \frac{1}{2} AE \times AD \times \sin\hat{A} = \frac{1}{2}\times 4\times 7\times \sin\hat{A} = \frac{28}{2}\sin\hat{A}$

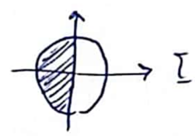
$|S_{A\hat{B}C} - S_{A\hat{D}E}| = \sin\hat{A}\left(\frac{35-28}{2}\right) = 1/75 \Rightarrow \sin\hat{A} = \frac{7}{4}\times\frac{2}{7} = \frac{1}{2}$



$\Rightarrow \tan\hat{A} = \frac{F'G'}{E'G'} = \frac{k}{k\sqrt{3}} = \frac{1}{\sqrt{3}}$

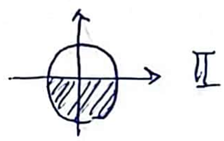
سوال ۳)

$\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|}$ و $\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha}$



$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1}{|\cos\alpha|} + \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{-\sin\alpha}{\cos\alpha} = \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow -\cos\alpha = |\cos\alpha|$

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \Rightarrow |\sin\alpha| = -\sin\alpha \Rightarrow$



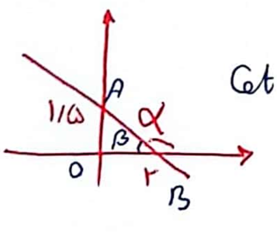
$I \cap II \Rightarrow$ در ناحیه سوم

سوال ۴)

در ناحیه اول ← ⊕

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

cot ← علامت تغییر tan



$\alpha + \beta = \pi \Rightarrow \cot\alpha = -\cot\beta$

$\cot\beta = \frac{OB}{OA} = \frac{2}{1/5} = \frac{4}{3}$

$\Rightarrow \cot\alpha = -\frac{4}{3}$

سوال ۵)

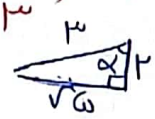
$\frac{3\cos(248^\circ) - 2\sin(158^\circ)}{\sin(202^\circ) - \cos(292^\circ)} = \frac{3\cos(270 - 22^\circ) - 2\sin(180^\circ - 22^\circ)}{\sin(180 + 22^\circ) - \cos(270 + 22^\circ)}$

$\frac{-3\sin(22^\circ) - 2\sin(22^\circ)}{-\sin(22^\circ) - \sin(22^\circ)} = \frac{-5\sin(22^\circ)}{-2\sin(22^\circ)} = \frac{5}{2} = 2/5$

سوال ۶)

$$\frac{\sin\left(\frac{\pi}{2}+\alpha\right)-\sin(\alpha-\pi)}{|\tan^2\alpha-1|}$$

$\cos\alpha=\frac{2}{3}$ و α در ربع سوم $\Rightarrow \sin\alpha<0$



$\Rightarrow$ ضلع سوم $=\sqrt{3^2-2^2}=\sqrt{5}$

$\Rightarrow |\sin\alpha|=\frac{\sqrt{5}}{3}$ در ربع سوم $\sin\alpha=-\frac{\sqrt{5}}{3}$

$$\frac{\cos(\alpha)+\sin(\alpha)}{|\tan^2\alpha-1|}=\frac{\frac{2}{3}-\frac{\sqrt{5}}{3}}{\left|\left(\frac{\sqrt{5}}{2}\right)^2-1\right|}=\frac{\frac{2-\sqrt{5}}{3}}{\frac{1}{4}}=\frac{4(2-\sqrt{5})}{3}$$

$\tan\alpha=\frac{\sqrt{5}}{2}$

سوال ۷)

$\sin\alpha=2\cos\alpha$ (I) و α در ربع سوم

$\sin^2\alpha+\cos^2\alpha=1 \quad (2\cos\alpha)^2+\cos^2\alpha=1 \quad 5\cos^2\alpha=1 \quad \cos^2\alpha=\frac{1}{5} \xrightarrow{\text{ربع سوم}} \cos\alpha=-\frac{1}{\sqrt{5}}$

(I) $\Rightarrow \sin\alpha=2\cos\alpha \Rightarrow \sin\alpha=\frac{-2}{\sqrt{5}}$

سوال ۸)

$2mx+(m^2-1)y=3$

$\longrightarrow$ شیب $=\tan\alpha=\sqrt{3}$

$y=\frac{-2m}{m^2-1}+\frac{3}{2m} \Rightarrow \frac{-2m}{m^2-1}=\sqrt{3} \quad \sqrt{3}m^2-\sqrt{3}+2m=0 \Rightarrow \frac{\sqrt{\Delta}}{|a|}=\frac{\sqrt{4-4(-3)}}{\sqrt{3}}=\frac{4}{\sqrt{3}}$

سوال ۹)

$\tan\left(\frac{\pi}{4}-x\right)=\frac{1-m}{2+m} \quad -\frac{3\pi}{4}<x<\frac{\pi}{4}$

$\tan\left(\frac{\pi}{4}-\frac{\pi}{4}\right)=\tan(0)=0$ ، $\tan\left(\frac{\pi}{4}-\left(-\frac{3\pi}{4}\right)\right)=\tan\left(\frac{\pi}{2}\right)=$ تعریف نشده $=+\infty$

$\frac{1-m}{2+m}>0$

	-2		1	
	$-$	ϕ	$+$	ϕ

$\Rightarrow -2<m<1$

سوال ۱۰)

$\tan(300^\circ)\cos(210^\circ)+\tan(450^\circ)\sin(150^\circ)$

$(-\sqrt{3})\left(-\frac{\sqrt{3}}{2}\right)+(-\sqrt{3})\left(\frac{1}{2}\right)=\frac{3}{2}-\frac{3}{2}=0$