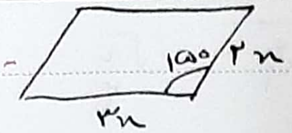
Subject: (یازدهم ریاضی)　　　　[illegible] - ۲۶

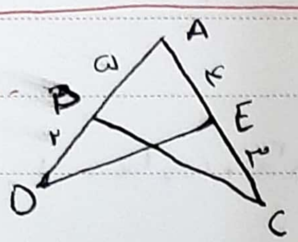
Year: .... Month: .... Day: .... ( )

1- 

$2\times\frac{1}{2}\times 2x\times 3x\times \sin 150 = 54$

$x^2 = 18 \Rightarrow x = 3\sqrt{2}$

محیط $\Rightarrow 10x = \boxed{30\sqrt{2}}$

2- 

$\frac{1}{2}\times 7\times 5\times \sin\hat{A} - \frac{1}{2}\times 7\times 4\times \sin\hat{A} = 1{,}75$

$\left(\frac{7}{2}\sin\hat{A}\right)(5-4) = \frac{7}{4}$

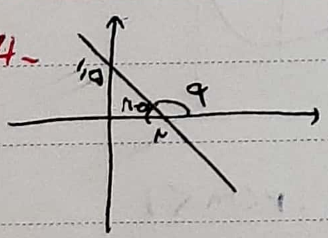
$\sin\hat{A} = \frac{1}{2} \Rightarrow \cos\hat{A} = \pm\frac{\sqrt{3}}{2} \Rightarrow \tan\hat{A} = \frac{\sqrt{3}}{3}$

3- $\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} = -\frac{\sin\alpha}{\cos\alpha} \Rightarrow |\sin\alpha| = -\sin\alpha \Rightarrow \sin\alpha < 0$

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

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

$|\cos\alpha| = -\cos\alpha \Rightarrow \cos\alpha < 0$

4- 

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

$-\tan(\pi-\alpha) = -\frac{1{,}5}{2} = -\frac{3}{4} = \tan\alpha$

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

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

$\frac{-5\sin 22}{-2\sin 22} = \boxed{2{,}5}$

6- $\sin\alpha < 0 \quad \cos\alpha > 0 \qquad \cos\alpha = \frac{2}{3} \longrightarrow \sin\alpha = \sqrt{1-\frac{4}{9}} = \frac{\sqrt{5}}{3}$

$$\frac{\sin\left(\frac{\pi}{2}+\alpha\right) - \overbrace{\sin(\alpha-\pi)}^{-\sin\alpha}}{|\tan^2\alpha - 1|} = \frac{\cos\alpha + \sin\alpha}{\left|\frac{\sin^2\alpha}{\cos^2\alpha} - 1\right|} = \frac{\frac{\sqrt{5}+2}{3}}{\left|\frac{5}{4}-1\right|} = \frac{\frac{\sqrt{5}+4}{3}}{\frac{1}{4}} = \frac{4\sqrt{5}+16}{3}$$

7- $\sin\alpha = 2\cos\alpha \qquad \sin\alpha, \cos\alpha < 0$

$\sin^2\alpha + \cos^2\alpha = 1 \Rightarrow 4\cos^2\alpha + \cos^2\alpha = 1$

$\Rightarrow \cos^2\alpha = \frac{1}{5} \Rightarrow \cos\alpha = \frac{\sqrt{5}}{5}$

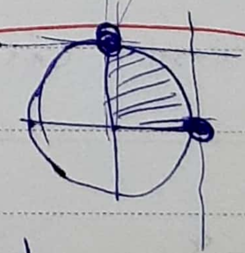
8. $2mx + (m^2-1)y = 3 \qquad -\frac{2m}{m^2-1} = \tan 60 = \sqrt{3}$

$\Rightarrow -2m = \sqrt{3}m^2 - \sqrt{3} \Rightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0 \longrightarrow m^2 + 2m - 3 = 0$

$(m-1)(m+3) = 0 \Rightarrow m_1 = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}, \quad m_2 = -\sqrt{3}$

$m_1 - m_2 = \frac{\sqrt{3}}{3} + \sqrt{3} = \boxed{\frac{4\sqrt{3}}{3}}$

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



$0 < \frac{\pi}{4} - x < \frac{\pi}{2} \Rightarrow \tan\left(\frac{\pi}{4}-x\right) = (0, +\infty)$

$\Rightarrow \frac{1-m}{2+m} > 0 \longrightarrow$ -2, 1: $-\ +\ -$ $\Rightarrow -2 < m < 1$

10- $\tan 300 \times \cos 210 + \tan 480 \times \sin 840$

$\pi + 120 \qquad \frac{\pi}{2} + 120 \qquad 2\pi + 120 \qquad 4\pi + 120$

$\tan 120 \times -\sin 120 + \tan 120 \times \sin 120 = \boxed{0}$