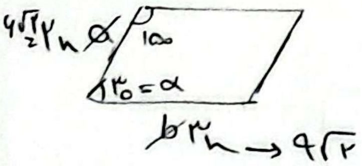
باران کاظمی — تکلیف صفحه ۲۶ — ۱۹

۱)



$S = ab\sin\alpha = 54$

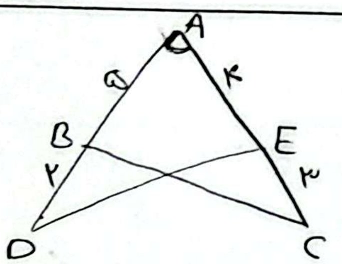
$2x \times 3x \times \frac{1}{2} = 54$

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

$6\sqrt{2} \to 9\sqrt{2}$

$(9\sqrt{2} + 6\sqrt{2}) \times 2 = \boxed{30\sqrt{2}}$

۲)



$S_{\overset{\triangle}{ABC}} - S_{\overset{\triangle}{ADE}} = 1.75$

$\frac{1}{2} \times 5 \times 7 \times \sin A - \frac{1}{2} \times 4 \times 7 \times \sin A = 1.75$

$\frac{1}{2} \times 7(\cancel{5\sin A - 4\sin A}) = 1.75 \to \sin A = \frac{1}{2}$

$\cos^2 A = 1 - \frac{1}{4} = \frac{3}{4} \to \cos\hat{A} = \frac{\sqrt{3}}{2} \to \tan\hat{A} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \boxed{\frac{\sqrt{3}}{3}}$

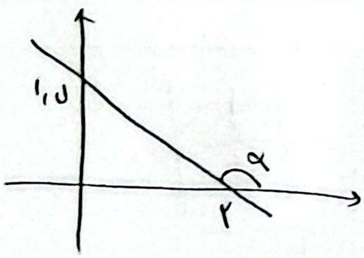
۳)

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \to \sin\alpha < 0$

$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|} \to \cos\alpha > 0$

ناحیه چهارم

۴)



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

شیب خط $\tan\alpha = -0.75 \to \cot\alpha = -\frac{100}{75} = \boxed{-\frac{4}{3}}$

$-\frac{1.5}{2} = -0.75$

۵)

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

$\frac{-3\sin(22) - 2\sin(22)}{-\sin(22) - \sin(22)} = \frac{-5}{-2} = \boxed{\frac{5}{2}}$

۴) $\frac{1}{|\cos\alpha|} - \frac{1+\sin\alpha}{|\cos\alpha|} = \tan\alpha \to \frac{-\sin\alpha}{|\cos\alpha|} = \frac{\sin\alpha}{\cos\alpha} \to \cos\alpha < 0$

(۶

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

$$=\frac{\cos\alpha+\sin\alpha}{|\tan^2\alpha-1|}=\frac{\frac{2}{3}-\frac{\sqrt5}{3}}{|\frac{5}{4}-1|}=\frac{\frac{2-\sqrt5}{3}}{\frac14}=\boxed{\frac{8-4\sqrt5}{3}}$$ ۵

$$1-\frac49=\sin^2\alpha=\frac59\xrightarrow{\text{ربع چهارم}}\sin\alpha=-\frac{\sqrt5}{3}\to\tan\alpha=\frac{-\frac{\sqrt5}{3}}{\frac{2}{3}}=-\frac{\sqrt5}{2}$$

(۷

$$\sin^2\alpha+\cos^2\alpha=1\to4\cos^2\alpha+\cos^2\alpha=1\to5\cos^2\alpha=1\to\cos^2\alpha=\frac15$$ ۵

$$\xrightarrow[\cos<0,\ \sin>0]{\text{ربع دوم}}\boxed{\cos\alpha=-\frac{\sqrt5}{5}}$$

(۸

$$2mx+(m^2-1)y=3\to y=\frac{-2mx}{(m^2-1)}+\frac{3}{(m^2-1)}$$

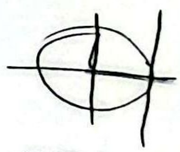
$\tan\alpha=$ شیب

$$\tan\alpha=\sqrt3\to\frac{-2m}{m^2-1}=\sqrt3\to-2m=\sqrt3m^2-\sqrt3\to\sqrt3m^2+2m-\sqrt3=0$$ ۵

$$m=\frac{-2\pm\sqrt{\cancel{4+12}}^{\,4}}{2\sqrt3}\begin{cases}\frac{-2+4}{2\sqrt3}=\frac{2}{2\sqrt3}=\frac{1}{\sqrt3}\\[2mm]\frac{-2-4}{2\sqrt3}=\frac{-\cancel{6}^{\,3}}{\cancel{2}\sqrt3}=-\frac{3}{\sqrt3}\end{cases}\to\frac{1}{\sqrt3}+\frac{3}{\sqrt3}=\boxed{\frac{4\sqrt3}{3}}$$

(۹

$$-\frac{\pi}{4}<x<\frac{\pi}{4}$$



$$-\frac{\pi}{4}<-x<\frac{\pi}{4}\xrightarrow{+\frac{\pi}{4}}0<-x+\frac{\pi}{4}<\frac{\pi}{2}$$ ۵

$$0<\tan(-x+\frac{\pi}{4})\ \therefore\ 0<\frac{1-m}{2+m}\qquad\begin{array}{ccccc}&-2&&1&\\-&|&+&|&-\end{array}\to\boxed{(-2,1)}$$

(۱۰

$$\tan(300^\circ)\cos(210^\circ)+\tan(480^\circ)\sin(840^\circ)$$

$$\tan(2\pi-60)\cos(\frac{3\pi}{2}-60)+\tan(3\pi+120)\sin(4\pi+120)$$ ۵

$$(-\tan60)(-\sin60)+(\tan120)(\sin120)=\frac{\sin^2 60}{\cos60}+\frac{\sin^2 120}{\cos120}$$

$$\frac{\frac34}{\frac12}+\frac{\frac34}{-\frac12}=\boxed{0}$$