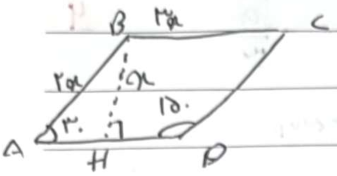
۱-

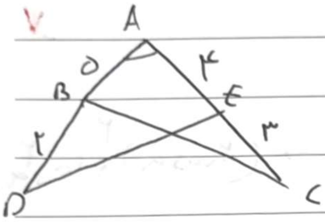


$S = 54 \qquad \sin 30^\circ = \frac{1}{2} \rightarrow BH = a \qquad S_{ABCD} = BH \times AD$

$a \times 3a = 54 \rightarrow 3a^2 = 54 \rightarrow a = \sqrt{18}$

محیط متوازی الاضلاع $= (2a + 3a) \times 2 = 10a = 10\sqrt{18} = 30\sqrt{2}$

۲-



$S_{ABC} = \frac{AB \times AC}{2} \times \sin\alpha \qquad S_{ADE} = \frac{AE \times AD}{2} \times \sin\alpha$

$S_{ABC} - S_{ADE} = 1/75 = \frac{5 \times 7}{2} \times \sin\alpha - \frac{4 \times 7}{2} \sin\alpha$

$\sin\alpha = \frac{1}{2} \rightarrow \cos\alpha = \frac{\sqrt{3}}{2} \rightarrow \tan\alpha = \frac{\sqrt{3}}{3}$

۳-

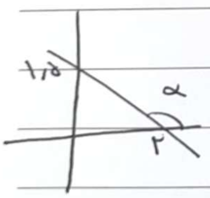
$\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|} \qquad \frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} \rightarrow \frac{|\sin\alpha|}{\cos\alpha} = -\tan\alpha \Rightarrow$

$\sin\alpha$ ← منفی است ← ناحیه ۳ یا ۴ $\qquad \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|}$

$-\frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|} - \frac{1}{|\cos\alpha|} \rightarrow -\frac{\sin\alpha}{\cos\alpha} = \frac{\sin\alpha}{|\cos\alpha|} \rightarrow \cos\alpha$ ← منفی است ← ناحیه ۲ و ۳

$\Rightarrow$ α ← در ناحیه سوم است

۴-



$\rightarrow$ شیب خط $= \tan\alpha \rightarrow \begin{vmatrix} 0 \\ 1/5 \end{vmatrix} \begin{vmatrix} 2 \\ 0 \end{vmatrix} \rightarrow$ شیب $= -\frac{3}{4}$

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

۵-

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

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

۶-

$$\frac{\sin(\frac{\pi}{2}+\alpha) - \sin(\alpha-\pi)}{|\tan^2\alpha-1|} \qquad \cos\alpha = \frac{2}{3} \rightarrow \sin\alpha = -\frac{\sqrt{5}}{3}$$

$$\rightarrow \frac{\cos\alpha+\sin\alpha}{|\tan^2\alpha-1|} = \frac{\frac{2}{3}-\frac{\sqrt{5}}{3}}{|\frac{5}{4}-1|} = \frac{8-4\sqrt{5}}{3}$$

ناحیه ۴

۷-

$\sin\alpha = 2\cos\alpha$ $\qquad \alpha \rightarrow$ ناحیه ۳ $\qquad \cos\alpha = ?$

$\sin\alpha = -$, $\cos\alpha = -$

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

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

۸-

$2mx + (m^2-1)y = 3$ $\qquad$ شیب $= \tan 60^\circ = \tan\alpha = \sqrt{3}$

$\rightarrow$ شیب $= \frac{-2m}{m^2-1}$ $\qquad \frac{-2m}{m^2-1} = \sqrt{3} \rightarrow \sqrt{3}m^2+2m-\sqrt{3} = 0$

$$\frac{\sqrt{\Delta}}{|a|} \rightarrow |m_1-m_2| = \frac{4\sqrt{3}}{3}$$

۹-

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

$\tan\alpha = -(x-\frac{\pi}{4}) = -\tan(x-\frac{\pi}{4}) \rightarrow \tan\alpha = \frac{1-m}{2+m}$

$$-\frac{3\pi}{4} < x-\frac{\pi}{4} < 0 \rightarrow 0 < \alpha < \frac{\pi}{2} \rightarrow$$

$\frac{1-m}{2+m} > 0 \rightarrow$ ناحیه ۱ $\rightarrow$ $-2 \quad 1$; $- \; + \; -$ $\rightarrow m \in (-2, 1)$

۱۰-

$$\tan(300^\circ)\cos(210^\circ) + \tan(480^\circ)\sin(840^\circ) = \frac{3}{2} + \frac{\sqrt{3}}{2} \times -\frac{\sqrt{3}}{2} = \frac{3}{2} - \frac{3}{2} = 0$$

$\tan(300^\circ) = -\sqrt{3}$, $\cos(210^\circ) = -\frac{\sqrt{3}}{2}$, $\tan(480^\circ) = \tan(120^\circ) = -\sqrt{3}$, $\sin(840^\circ) = \sin(120^\circ) = \frac{\sqrt{3}}{2}$

LINE NOTE