$A\begin{vmatrix}4\\-6\end{vmatrix} \quad B\begin{vmatrix}2\\8\end{vmatrix}$

$a = \frac{8+6}{2-4} = \frac{14}{-2} = -7$ — شیب عمودمنصف: $a' = \frac{1}{7}$

$M = \begin{vmatrix}\frac{4+2}{2}\\ \frac{8+(-6)}{2}\end{vmatrix} \Rightarrow \begin{vmatrix}3\\1\end{vmatrix}$

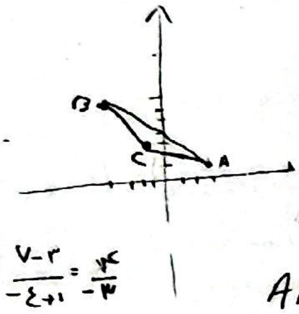
$y - 1 = \frac{1}{7}(x-3)$

$y = \frac{1}{7}x - \frac{3}{7} + \frac{7}{7} \Rightarrow 7y = x - 4$

$A\begin{vmatrix}3\\1\end{vmatrix}$

$B\begin{vmatrix}-4\\7\end{vmatrix}$

$C\begin{vmatrix}-1\\3\end{vmatrix}$, $a = \frac{7-3}{-4+1} = \frac{4}{-3}$



$BC = \sqrt{(-4+1)^2 + (7-3)^2} = 5$ (9, 16)

$BC - AH = 5 - 2 = 3$

$BC = y - 3 = \frac{-4}{3}(x+1) \rightarrow y = -\frac{4}{3}x - \frac{4}{3} + \frac{9}{3} \rightarrow 3y = -4x + 5$

$AH = \frac{|3+12-5|}{\sqrt{9+16}} = \frac{10}{5} = 2$

$2y - x = 7$

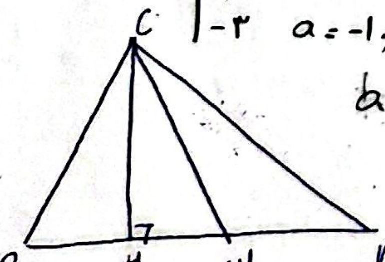
$4y - ax = 2$

$\xrightarrow{\text{موازی}}$ $y - \frac{1}{2}x = \frac{7}{2}$, $y - \frac{a}{4}x = \frac{1}{2}$ → $a = 2$ → $4y - 2x = 14 \rightarrow 2y - x = 7$

مرکز دایره = $\begin{vmatrix}x_0\\y_0\end{vmatrix}$

$d = \frac{|7-1|}{\sqrt{1+4}} = \frac{6}{\sqrt5} = 2r \Rightarrow r = \frac{3}{\sqrt5} \rightarrow S = \pi r^2 = \pi \times \frac{9}{5} = \frac{9}{5}\pi$

$C\begin{vmatrix}-1\\-3\end{vmatrix}$



$B\begin{vmatrix}4\\1\end{vmatrix}$ $H\begin{vmatrix}3.5\\1.5\end{vmatrix}$ $M\begin{vmatrix}3\\2\end{vmatrix}$ $A\begin{vmatrix}2\\3\end{vmatrix}$

$a = -1,\ AB = y - 3 = -1(x-2) \rightarrow y = -x + 2 + 3 \rightarrow y = -x + 5$

$a = -1 \rightarrow a' = 1$, $y + 3 = 1(x+1) \Rightarrow y = x + 1 - 3 \rightarrow y = x - 2$

$y + x = 5$
$y - x = -2$
$2y = 3 \rightarrow y = \frac{3}{2}$, $x = 3.5$

$MH = \sqrt{(3-3.5)^2 + (2-1.5)^2} = \frac{1}{\sqrt2}$ ($\frac14$, $\frac14$)

$(m+1)x - (2m-4)y + 1 = 0 \rightarrow$ شیب $= \frac{m+1}{2m-4}$

$(3m-2)x + (5-m)y - 7 = 0 \rightarrow$ شیب $= \frac{3m-2}{-5+m}$

$\frac{m+1}{2m-4} = \frac{5-m}{3m-2}$

$3m^2 + m - 2 = -2m^2 + 14m - 20 \rightarrow 5m^2 - 13m + 18 = 0 \rightarrow \Delta < 0$

به ازای هیچ مقدار m این دو خط عمود نیستند

$AB: x+2y=3$, $AC: y=2x-1$, $BC: x+y=2$

$A\left|\begin{matrix}1\\1\end{matrix}\right.$, $B\left|\begin{matrix}3\\-1\end{matrix}\right.$, $C\left|\begin{matrix}\frac{5}{3}\\\frac{1}{3}\end{matrix}\right.$, $M\left|\begin{matrix}\frac{10}{3}\\\frac{2}{3}\end{matrix}\right.$

$AH = \frac{|1+1-2|}{\sqrt{2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$

$AM = \sqrt{(1-\frac{10}{3})^2 + (1-\frac{2}{3})^2} = \sqrt{\frac{49}{9}+\frac{1}{9}} = \frac{\sqrt{50}}{3}$

$\frac{AM}{AH} = \frac{\frac{\sqrt{50}}{3}}{\sqrt{2}} = \frac{5\sqrt{2}}{3\sqrt{2}} = \frac{5}{3}$

$\left|\begin{matrix}A\\0\end{matrix}\right.$, $\left|\begin{matrix}0\\B\end{matrix}\right.$ $\quad y-0=-\frac{1}{2}(x-A) \rightarrow y=-\frac{1}{2}x+\frac{A}{2}+B$

$AB = \sqrt{A^2+B^2} = \sqrt{10+10} = 5\sqrt{2}$

$\frac{x}{A}+\frac{y}{B}=1 \rightarrow \frac{x}{2B}+\frac{y}{B}=1 \rightarrow Bx+2y=2B \rightarrow d = \frac{|0+0-2B|}{\sqrt{5}}$

$a = \frac{B-0}{0-A} = -\frac{B}{A} = -\frac{1}{2} \rightarrow A=2B \quad \rightarrow |-2B|=10$

$2B=10 \rightarrow B=5 \rightarrow a=10$

$-2B=10 \rightarrow B=-5 \rightarrow a=-10$

$my-2x=2m \xrightarrow{y=0} x=-\frac{m}{2} \rightarrow -\frac{m}{2}=\frac{5}{2} \Rightarrow m=-5$

$y+mx=x+2 \xrightarrow{x=0} y=2 \rightarrow x=-\frac{2}{1-m} \rightarrow -\frac{2}{1-m}=\frac{5}{2} \Rightarrow m=\frac{9}{5}$

$m=-5 \mid m=\frac{9}{5} \Rightarrow -5\times\frac{9}{5}=-9$

$y=2x-2 \quad m=2 \quad y=2x-2 \xrightarrow{x=0} \left\{\begin{matrix}0\\-2\end{matrix}\right\}$

$M\left|\begin{matrix}2\\-2\end{matrix}\right.$

$y+1=2(x-2) \Rightarrow y=2x-5$

$2=\frac{0+x'}{2} \rightarrow x'=4$

$-2=\frac{-2+y'}{2} \rightarrow y'=-1$ $\quad \left\{\begin{matrix}4\\-1\end{matrix}\right\}$

$A\left|\begin{matrix}1\\2\end{matrix}\right.$ $\quad y=2x+5$ $\quad A(a,b)$ $\quad 2b-a=?$

$x_B = \frac{1+a}{2} = -1 \rightarrow a=-3$ $\quad \left\{\begin{matrix}-3\\4\end{matrix}\right\}$

$y_B = \frac{2+b}{2} = +2 \rightarrow b=4$

$2b-a=12+3=15$