

$A(2, -4) \quad B(1, 1) \quad M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) = (3, 1)$
 $m_{AB} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - (-4)}{1 - 2} = \frac{5}{-1} = -5$
 $m_{\perp AB} = \frac{-1}{-5} = \frac{1}{5}$ معادله عمود: $y - y_M = m(x - x_M)$

$$y - 1 = \frac{1}{5}(x - 1) \Rightarrow y = \frac{1}{5}x + \frac{4}{5}$$

$A(2, 1) \quad B(-2, 5) \quad C(-1, 3) \quad m_{BC} = \frac{4}{-3}$
 $d_{BC} = \sqrt{(x_B - x_C)^2 + (y_B - y_C)^2} = \sqrt{(-2 - (-1))^2 + (5 - 3)^2} = \sqrt{1 + 4} = \sqrt{5}$
 $BC \text{ خط: } y - 4 = \frac{4}{-3}(x - 5) \Rightarrow y = -\frac{4}{3}x + \frac{20}{3}$
 $AH = \frac{|11x + 3y - 20|}{\sqrt{11^2 + 3^2}} = \frac{10}{\sqrt{130}} = \frac{1}{\sqrt{13}}$
 $\Delta = 2 - 2 \times \frac{1}{\sqrt{13}}$

$ry - rx = v$
 $\begin{cases} ry - rx = 14 \\ ry - ax = r \Rightarrow a = r \end{cases} \quad \frac{1}{\sqrt{a^2 + b^2}} = \frac{|c - c'|}{\sqrt{14^2 + 1^2}} \Rightarrow \frac{1}{\sqrt{197}} = \frac{1}{\sqrt{197}} \Rightarrow r = \frac{1}{\sqrt{197}}$

$$S_{\text{شکل}} = \pi r^2 = \pi \times \frac{1}{197} = \frac{\pi}{197}$$

$A(2, 3) \quad B(4, 1) \quad C(-1, -2) \quad M(3, 2)$
 $m_{AB} = \frac{1 - 3}{4 - 2} = -1 \quad \text{خط } AB: y - 3 = -1(x - 2) \Rightarrow y = -x + 5$
 $CH \text{ خط: } \frac{1 - 3 + 2 - 1}{\sqrt{1^2 + 1^2}} = \frac{1}{\sqrt{2}}$
 $HN = \sqrt{(CM)^2 - (CH)^2} = \sqrt{5 - \frac{1}{2}} = \sqrt{\frac{9}{2}} = \frac{3}{\sqrt{2}}$

$(m+1)x + (a-m)y - v = 0 \rightarrow aa' - bb' = 0$
 $(m+1)x - (vm - 1)y + 1 = 0$

$(m+1)(m+1) - (a-m)(vm-1) = 0$
 $vm^2 - vm + vm - 1 + vm^2 - vm - 1am + 1 = 0$
 $2vm^2 - 1vm + 1 = 0$
 $vm^2 - 1vm + 1 = 0 \quad \Delta < 0$

مستقیم

$$AB: x+y = 3$$

$$AC: y = 2x-1$$

$$BC: x+y = 1$$

$$AC, AB: x + y(2x-1) = 3 \quad \begin{matrix} x=1 \\ y=1 \end{matrix} \quad A \begin{vmatrix} 1 \\ 1 \end{vmatrix}$$

$$AC, BC: x + 2x-1 = 1 \quad \begin{matrix} x=\frac{2}{3} \\ y=\frac{1}{3} \end{matrix} \quad C \begin{vmatrix} \frac{2}{3} \\ \frac{1}{3} \end{vmatrix}$$

$$AB, BC: x+y=3 \quad \begin{matrix} y=-1 \\ x=2 \end{matrix} \quad B \begin{vmatrix} 2 \\ -1 \end{vmatrix}$$

$$AH = \frac{|1+1-3|}{\sqrt{1^2+1^2}} = \frac{1}{\sqrt{2}} = \sqrt{2}$$

$$AH = \frac{|2+2-1|}{\sqrt{2^2+1^2}} = \frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$$

$$\frac{AH}{AB} = \frac{\frac{3\sqrt{5}}{5}}{\sqrt{2}} = \left(\frac{\omega}{\sqrt{2}}\right)$$

$$m = -\frac{1}{r} \quad y = -\frac{1}{r}x + b$$

$$+\frac{1}{r}x + y - b = 0$$

$$AH = \frac{|b|}{\sqrt{\frac{1}{r^2} + 1}} = \sqrt{r} \Rightarrow |b| = \sqrt{r} \times \frac{\sqrt{5}}{r} = \omega$$

$$0 = -\frac{1}{r}x + b \quad x = rb \quad \text{حل بر حسب r و b}$$

$$AH = \sqrt{(rb)^2 + (-b)^2} = \sqrt{ab^2} = \sqrt{ab} \times \omega = \sqrt{2}\omega$$

$$y = (1-m)x + r \quad y = \frac{r}{m}x + r$$

$$\frac{r}{m} + r = x - mx + r \sim (0, r) \text{ راس}$$

$$(1-m)x + r = 0 \quad x = \frac{r}{m-1}$$

$$\frac{r}{m}x + r = 0 \quad x = -\frac{m}{r}$$

حل بر حسب r و m

$$S = \frac{1}{r} \times r \times \left(\frac{r}{m-1} - \left(-\frac{m}{r} \right) \right) = \frac{\omega}{r}$$

$$\frac{r}{m-1} + \frac{m}{r} = \frac{r+m^2-m}{r(m-1)} = \frac{\omega}{r} \quad \begin{matrix} m-m+\varepsilon = \omega m - \omega \\ m^2 - m + \varepsilon = \omega m + \omega \\ m^2 - m + \varepsilon + 1 = \omega m + \omega + 1 = \omega \end{matrix}$$

$$x_m = \frac{0+x_d}{r} = r \quad x_d = r \quad (r, 1) \text{ و } (0, -r) \quad y = rx - r \text{ در نظر بگیرید}$$

$$y_m = \frac{-r+y_d}{r} = -1 \quad y_d = -1 \quad (r, -1)$$

$$x_m = \frac{r+x_d}{r} = r \quad x_d = r \quad (r, -\omega) \quad y = rx - \omega$$

$$y_m = \frac{1+y_d}{r} = -r \quad y_d = -\omega \quad (r, -\omega) \quad y = rx - \omega$$

$$m_{AA'} = \frac{-1}{m_y} = -1 \quad AA': y - r = -1(x-1) \Rightarrow y = -x + r$$

$$x + r = x + \omega \quad x = -1 \quad y = r$$

$$x_m = \frac{x_A + x_{A'}}{r} = \frac{1+x_{A'}}{r} = -1 \quad a = x_{A'} = -r$$

$$y_m = \frac{y_A + y_{A'}}{r} = \frac{r+y_{A'}}{r} = r \quad b = y_{A'} - r$$

$$1r \in 5r = 1\omega$$