

$A(1, -4) \rightarrow M_{AB} = \frac{1 - (-4)}{1 - 1} = \frac{14}{-2} = -7 \quad M' = \frac{1}{7}$
 $B(1, 1) \rightarrow \left. \begin{array}{l} y - 1 = \frac{1}{7}(x - 1) \\ y - 1 = \frac{1}{7}(x - 1) \end{array} \right\} \xrightarrow{\text{معادله}} y - 1 = \frac{1}{7}(x - 1)$
 $\rightarrow y = \frac{1}{7}x + \frac{6}{7}$
 نقطه وسط $\rightarrow x = \frac{1 + (-4)}{2} = -\frac{3}{2} \quad n = \frac{1 + 1}{2} = 1 \quad A'(1, 1) \Rightarrow y = \frac{1}{7}x + \frac{6}{7}$

$(1, 1) A \quad BC \text{ معادله} \Rightarrow m_{BC} = \frac{1 - (-4)}{-4 + 1} = \frac{5}{-3} = -\frac{5}{3} \quad C(-1, 3) \quad y - 3 = -\frac{5}{3}(x + 1) \Rightarrow$
 $y = -\frac{5}{3}x + \frac{10}{3} \quad AH \text{ معادله} = |1 + 1 - \frac{0}{3}| = \frac{10}{3} = \boxed{10}$
 $y + \frac{5}{3}x - \frac{10}{3} = 0 \Rightarrow \text{فاصله نقطه از خط} \quad A(1, 1) \quad \sqrt{1 + \frac{25}{9}} = \frac{10}{3} = \boxed{10}$
 $d_{AH} = 10 \quad BC = \sqrt{(1 - (-1))^2 + (1 - 3)^2} = \sqrt{4 + 4} = \sqrt{8} \quad BC - AH = \boxed{10}$

فاصله دو خط موازی $\leftarrow$ مقدار $d = \frac{|11 \cdot 1 + 21|}{\sqrt{11^2 + 21^2}} = \frac{32}{\sqrt{500}}$
 $4y - 2x = 2 \Rightarrow 2x = 4y - 2 \Rightarrow x = 2y - 1$
 $2y - x = 5 \Rightarrow 2y - (2y - 1) = 5 \Rightarrow 1 = 5$
 $r = \frac{4}{\sqrt{5}} \times \frac{1}{2} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$
 $S = \pi r^2 = \pi \left(\frac{2\sqrt{5}}{5}\right)^2 = \frac{4}{5}\pi$

$M \rightarrow \left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) \Rightarrow \left(\frac{1 + 1}{2}, \frac{-4 + 1}{2}\right) \Rightarrow M(1, -\frac{3}{2})$
 میان H $\left\{ \begin{array}{l} AB \text{ معادله} : m_{AB} = \frac{1 - (-4)}{1 - 1} = \frac{5}{0} = \infty \quad y - 1 = \infty(x - 1) \Rightarrow y = -x + 2 \\ CH \text{ معادله} : m_{CH} = \frac{1}{1} = 1 \quad y - (-1) = 1(x - (-1)) \Rightarrow y = x - 2 \end{array} \right.$
 $x - 2 = -x + 2 \Rightarrow 2x = 4 \Rightarrow x = 2 \quad y = \frac{1}{2} \quad H\left(\frac{1}{2}, \frac{1}{2}\right)$
 $MH = \sqrt{\left(\frac{1}{2} - 1\right)^2 + \left(\frac{1}{2} - \frac{3}{2}\right)^2} = \sqrt{\frac{1}{4} + 1} = \sqrt{\frac{5}{4}} = \frac{\sqrt{5}}{2}$

$C \Rightarrow y = 2x - 1, y = -x + 1 \quad -x + 1 = 2x - 1 \Rightarrow x = \frac{2}{3} \quad C\left(\frac{2}{3}, \frac{1}{3}\right)$
 $A : AC, AB \text{ معادله} : -\frac{2}{3} + \frac{1}{3} = 2x - 1 \Rightarrow A(1, 1)$
 $B : BC, AB \text{ معادله} : x + 2y = 1 \quad x + y = 1 \quad -2y + 1 = -y + 1 \Rightarrow B(0, 1)$
 $AM \rightarrow \text{نقطه} \rightarrow \left(\frac{0 + \frac{2}{3}}{2}, \frac{\frac{1}{3} - 1}{2}\right) = \left(\frac{1}{3}, -\frac{1}{3}\right) \quad AM = \sqrt{\left(1 - \frac{1}{3}\right)^2 + \left(1 - \left(-\frac{1}{3}\right)\right)^2} = \sqrt{\frac{4}{9} + \frac{16}{9}} = \sqrt{\frac{20}{9}} = \frac{2\sqrt{5}}{3}$
 $AH \rightarrow \text{فاصله نقطه از خط} \quad \frac{|a \cdot 1 + b \cdot 1 + c|}{\sqrt{a^2 + b^2}} = \frac{|1 + 1 - 1|}{\sqrt{1 + 1}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$
 $x + y - 1 \quad / (1, 1)$
 $\frac{AH}{AM} = \frac{\frac{\sqrt{2}}{2}}{\frac{2\sqrt{5}}{3}} = \frac{3\sqrt{2}}{4\sqrt{5}}$

$$1 = \frac{y}{b} + \frac{z}{a} \quad m = \frac{-1}{r} = \frac{-b}{a} \quad b = \frac{a}{r} \quad (1) \quad |B(.,b), A(a,.)|$$

$$\Rightarrow 1 = \frac{ay + bn}{ab} \Rightarrow ay + bn - ab = 0 \quad \text{مسافة} = \frac{|c|}{\sqrt{a^2 + b^2}} = \frac{|ab|}{\sqrt{a^2 + b^2}} = \sqrt{r}$$

$$\xrightarrow{\text{①}} \frac{|a \cdot \frac{a}{r}|}{\sqrt{a^2 + \frac{a^2}{r^2}}} = \frac{\frac{a^2}{r}}{\frac{a\sqrt{50}}{r}} = \sqrt{r} \Rightarrow \frac{a}{\sqrt{50}} = \sqrt{r} \Rightarrow a = 10, b = a$$

$$B = (0, a), A(1, 0) \Rightarrow AB = \sqrt{10^2 + 0^2} = \sqrt{100} = 10$$

$$my = rx + rm \quad y = \frac{r}{m}x + r \quad \text{مضروب} \rightarrow$$

$$y = -mx + n + r \quad y = (1-m)x + r \quad (0, r)$$


$$S = \frac{1}{r} \times r \times |nr - n_1|$$

$$\frac{\delta}{r} = |nr - n_1| \quad nr \Rightarrow \frac{r}{m}x + r = 0 \Rightarrow -r \leq \frac{r}{m}x \Rightarrow x = \frac{-m}{r}$$

$$n_1 \Rightarrow 0 = r + (1-m)x \Rightarrow x = \frac{-r}{-m+1} = \frac{r}{m-1}$$

$$\frac{\delta}{r} = \left| \frac{-m}{r} - \frac{r}{m-1} \right|, \quad \frac{\delta}{r} = \frac{-m}{r} - \frac{r}{m-1} \Rightarrow \frac{\delta}{r} = \frac{-m^2 + m - r}{m - r}$$

$$1 - \frac{\delta}{r} = \frac{-m}{r} - \frac{r}{m-1} \Rightarrow \frac{-\delta}{r} = \frac{-m^2 + m - r}{m - r}$$

$$\delta m - \delta = -m^2 + m - r \Rightarrow m^2 + rm - 1 = 0 \rightarrow \delta = -1$$

$$-\delta m + \delta = -m^2 + m - r \Rightarrow m^2 - 9m + 9 = 0 \quad (m-4)^2 = 0 \quad m = 4$$

$$S_{\text{min}} = r \times -1 = -r$$

$$M(r, r) \text{ نقطة تقاطع } A' \leftarrow A(1, -1) \quad 9$$

$$x_m = \frac{x_A + x_{A'}}{r} \Rightarrow r = \frac{1 + x_{A'}}{r} \Rightarrow x_{A'} = r$$

$$y_m = \frac{y_A + y_{A'}}{r} \Rightarrow -r = \frac{-1 + y_{A'}}{r} \Rightarrow y_{A'} = -r \quad A'(r, -r)$$

$$y = rx - 9 \quad \leftarrow y + 9 = r(x - 4) \quad \leftarrow \begin{cases} r = \text{خط} \\ (4, -4) \text{ نقطة مرور (تقاطع)} \end{cases}$$

$$A(1, r) \leftarrow B \dots A' \quad d \text{ خط}$$

$$y = x + a$$

$$A' \Rightarrow x_{A'} = rx_B - x_A = -r - 1 = -r$$

$$y_{A'} = ry_B - y_A = 1 - r = 4 \quad A'(-r, 4)$$

$$y = -x + r \quad B(-1, r) \quad x = -1$$

$$B: \text{خط} : -x + r = x + a \Rightarrow rx = -r$$

$$a = -r$$

$$b = 4$$

$$r \times 4 - (-r) = 10$$

$$(m+1)x - (r_m - r)y + 1 \leq 0 \Rightarrow m_1 \leq \frac{-a}{b} = \frac{m+1}{r_m - r} \quad - \text{و د ب}$$

$$(r_m + r)x + (\delta - m)y - V \leq 0 \Rightarrow m_2 = \frac{r - r_m}{\delta - m}$$

$$m_1 \cdot m_2 \leq -1 \Rightarrow m_1 \leq \frac{-1}{m_2} \Rightarrow \frac{m+1}{r_m - r} \leq \frac{-m + \delta}{r - r_m} = -1$$

$$\Rightarrow r_m r + m - r \leq -r_m r + 1 r_m + r$$

$$\Rightarrow \delta m^r - 1 r_m + 1 \Delta \leq 0 \Rightarrow \Delta \{ \quad \text{برای هیچ مقدار از } m$$