

$$a \leq \frac{-14}{4} \leq -\frac{7}{2} \Rightarrow \text{شرط } a = \frac{1}{4} \Rightarrow y \leq \frac{1}{4}x + b$$

$$\text{نقطه وسط } M \leq \frac{2+4}{2} = 3, y \leq \frac{-4+1}{2} = -\frac{3}{2} \rightarrow (3, -\frac{3}{2})$$

$$1 = \frac{1}{4}(3) + b \Rightarrow b \leq \frac{5}{4}, y \leq \frac{1}{4}x + \frac{5}{4}$$

$$\text{طول ضلع } BC \leq \sqrt{(3)^2 + (1)^2} = \sqrt{10}$$

$$\text{ضلع } BC \Rightarrow a \leq \frac{5}{4} \rightarrow y \leq \frac{5}{4}x + b \xrightarrow{(-1, -3)} -3 = \frac{5}{4} + b \Rightarrow b \leq -\frac{17}{4} \Rightarrow \frac{5}{4}x + y - \frac{17}{4} \leq 0$$

$$\text{فاصله نقطه } A \text{ از خط } BC \leq \frac{|4 + 1 - \frac{17}{4}|}{\sqrt{1 + \frac{25}{16}}} = \frac{\frac{10}{4}}{\frac{5}{4}} = \frac{10}{5} = 2$$

$$BC - AH \leq 5 - 2 = 3$$

$$\text{فاصله نقطه از هم} = \text{قطر دایره} \quad 4y - 2x - 2 \leq 0 \rightarrow a \leq \frac{2}{4} \quad / \quad 2y - x - 1 \leq 0 \rightarrow a \leq \frac{1}{2}$$

$$d \leq \frac{|c - c'|}{\sqrt{a^2 + b^2}} \quad \text{در خط موازی} \Rightarrow \frac{a}{4} \leq \frac{1}{2}, a \leq 2 \quad \hookrightarrow x^2 = 4y - 2x - 1 \leq 0$$

$$4y - 2x - 2 \leq 0, 4y - 2x - 1 \leq 0$$

$$d \leq \frac{|-2 + 14|}{\sqrt{14 + 4}} = \frac{12}{\sqrt{18}} = \frac{4}{\sqrt{2}} \Rightarrow \text{شعاع دایره} \leq \frac{3}{\sqrt{2}} \text{ و مساحت دایره} \leq \pi r^2 \leq \frac{9}{2} \pi$$

$$M(\frac{2+4}{2}, \frac{3+1}{2}) \Rightarrow M(3, 2) \quad \text{AB موازی } y \leq -x + 5$$

$$\text{شیب } AB \leq \frac{2}{-1} = -2 \Rightarrow \text{شیب } AH = 1, y \leq x + b \xrightarrow{(-1, -3)} b \leq -2$$

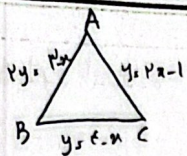
$$\begin{cases} y \leq x - 2 \\ y \leq -x + 5 \end{cases} \quad 2y \leq 3, y \leq \frac{3}{2}, x \leq \frac{5}{2} \quad H(\frac{5}{2}, \frac{3}{2})$$

$$MH = \sqrt{(\frac{3}{2} - \frac{5}{2})^2 + (\frac{3}{2} - \frac{3}{2})^2} = \sqrt{\frac{1}{4} + \frac{1}{4}} = \frac{\sqrt{2}}{2}$$

$$\begin{cases} (m+1)x - (2m-4)y + 1 \leq 0 \rightarrow a \leq \frac{-(m+1)}{-(2m-4)} = \frac{m+1}{2m-4} \\ (3m-2)x + (5-m)y - 5 \leq 0 \rightarrow a \leq \frac{2-3m}{5-m} \end{cases} \Rightarrow \text{بر هم ضرب} = \frac{m+1}{2m-4} \leq \frac{5-m}{3m-2}$$

$$(m+1)(3m-2) \leq (5-m)(2m-4) \rightarrow 3m^2 - 13m + 2 \leq 0, \Delta \leq 149 - 360 = -191$$

$\Delta < 0$ و $\Delta < 0 \Rightarrow$ هیچ نقطه‌ای برای m وجود ندارد



$$A \begin{cases} y = 3 - x \\ y = 2x - 1 \end{cases} \rightarrow y = 1, x = 1 \quad / \quad B \begin{cases} y = 3 - x \\ y = 2x - 1 \end{cases} \rightarrow y = -1, x = 2$$

$$C \begin{cases} y = 2x - 1 \\ y = 3 - x \end{cases} \rightarrow y = \frac{2}{3}, x = \frac{5}{3}$$

$$M \left(\frac{2 + \frac{5}{3}}{2}, \frac{-1 + \frac{2}{3}}{2} \right) \rightarrow M \left(\frac{1}{2}, \frac{1}{6} \right), \quad \text{طول} = \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{1}{6}\right)^2} = \sqrt{\frac{1}{3}} = \frac{\sqrt{3}}{3}$$

$$\text{نقطه} \quad y = 3 - x, \quad y = 2x - 1 \Rightarrow \text{طول} = d = \frac{1 + 1 - 1}{\sqrt{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} \quad \frac{AM}{AH} = \frac{\frac{\sqrt{3}}{3}}{\frac{\sqrt{2}}{2}} = \frac{\omega}{\frac{2}{3}}$$

$$y = mx + b, (0, A), (B, 0) \quad / \quad y = -\frac{1}{2}x + c, A(0, c), B(2c, 0)$$

$$d = \frac{|0 + 0 + c|}{\sqrt{1 + m^2}} = \frac{|c|}{\sqrt{2}}, \quad \frac{|c|}{\sqrt{2}} = \frac{\sqrt{2}}{2} \Rightarrow |c| = 1 \Rightarrow c = 1 \text{ or } -1$$

$$AB = \sqrt{(2c - 0)^2 + (0 - c)^2} = \sqrt{5c^2} = |c| \sqrt{5} \Rightarrow AB = \sqrt{5}$$

$$(1) \text{ خط } y = \frac{2}{m}x + 2 \quad \text{و} \quad (2) \text{ خط } y = (1 - m)x + 2 \quad \text{و} \quad y = 0$$

$$\text{نقطه تقاطع} \quad \left(-\frac{m}{2}, 0\right) \quad \text{و} \quad \left(\frac{2}{m-1}, 0\right) \quad \text{و} \quad \text{ارتفاع مثلث برابر با } \frac{2}{m-1}$$

$$\text{مساحت} = \frac{\text{ارتفاع} \times \text{قاعده}}{2} = \frac{\frac{2}{m-1} \times \left(-\frac{m}{2}\right) \times \frac{2}{m-1}}{2} = \frac{\omega}{2} \Rightarrow \left|\frac{2}{m-1} + \frac{m}{2}\right| = \frac{\omega}{2}$$

$$\frac{2}{m-1} + \frac{m}{2} = \frac{\omega}{2} \Rightarrow m = 3 \quad \frac{2}{m-1} + \frac{m}{2} = \frac{\omega}{2} \Rightarrow m = -2 \pm \sqrt{5} \Rightarrow (-2 + \sqrt{5})(-2 - \sqrt{5})(3) = -3$$

$$\text{نقطه تقاطع} \quad (0, -3) \quad \text{و} \quad \left(\frac{2}{3}, 0\right) \quad \frac{\frac{2}{3} + 0}{\frac{2}{3}} = 2 \Rightarrow x = \frac{\omega}{2}, \quad \frac{y + 0}{\frac{2}{3}} = 2 \Rightarrow y = -4 \quad \left(\frac{\omega}{2}, -4\right)$$

$$\frac{0 + x}{\frac{2}{3}} = 2 \Rightarrow x = 4, \quad \frac{-3 + y}{\frac{2}{3}} = 2 \Rightarrow y = 1 \quad (4, 1)$$

$$\text{خط } a = \frac{-3}{-2} = 1.5, \quad y = 2x + b \rightarrow -1 = 2(4) + b \Rightarrow b = -9 \rightarrow y = 2x - 9$$

خطی که نقطه A و نقطه B را به هم وصل کند بر خط $y = x + 5$ عمود است در سبب آن برابر با (-1) است

$$y = -x + b \quad (1, 2) \rightarrow 2 = -1 + b \Rightarrow b = 3, \quad y = -x + 3$$

$$\begin{cases} y = -x + 3 \\ y = x + 5 \end{cases} \quad y = 4, \quad y = 4 \Rightarrow x = -1 \quad (-1, 4) \rightarrow \text{نقطه تقاطع در خط}$$

$$(a, b) / (1, 2) \rightarrow \frac{a + 1}{2} = -1 \Rightarrow a = -3, \quad \frac{b + 2}{2} = 4, \quad b = 6$$

$$2b - a = 2 \times 6 + 3 = 15$$