

$$\left. \begin{matrix} A(-r, k) \\ B(r, m) \end{matrix} \right\} \rightarrow -\frac{1}{r}x + b = y \Rightarrow \begin{matrix} -\frac{1}{r}(-r) + b = k \rightarrow b + 1 = k \rightarrow b = k - 1 \\ -\frac{1}{r}(r) + b = m \rightarrow b - 1 = m \rightarrow b = m + 1 \end{matrix}$$

$$\Rightarrow k - 1 = m + 1 \rightarrow k - m = 2$$

$$AB = \sqrt{\Delta x^2 + \Delta y^2} = \sqrt{r^2 + 4}$$

$$S = a^2 = \sqrt{r^2 + 4}^2 = r^2 + 4$$

$$rmx + (m^2 - 1)y = r \Rightarrow (m^2 - 1)y = -rmx + r$$

$$y = \frac{-rm}{m^2 - 1}x + \frac{r}{m^2 - 1} \rightarrow \frac{-rm}{m^2 - 1} = \sqrt{3} \rightarrow -rm = \sqrt{3}m^2 - \sqrt{3}$$

$$\Rightarrow \sqrt{3}m^2 + rm - \sqrt{3} = 0 \quad \Delta = 9 + 12 = 21 \quad m = \frac{-r \pm \sqrt{21}}{2\sqrt{3}}$$

$$= \frac{r}{\sqrt{3}} \text{ و } \frac{-r}{\sqrt{3}} = \frac{\sqrt{3}}{r} \text{ و } -\sqrt{3} \rightarrow \frac{\sqrt{3}}{r} - (-\sqrt{3})$$

$$= \frac{\sqrt{3}}{r} + \sqrt{3} = \frac{r\sqrt{3}}{r}$$



$B(3, 3)$ $C(9, 11)$

$$BC \Rightarrow m = \frac{\Delta y}{\Delta x} = \frac{1}{2} = \frac{1}{2} \rightarrow 2x + b = y \xrightarrow{BC(3, 3)} 9 + b = 3 \rightarrow b = -6$$

$$\Rightarrow BC = 2x - 3$$

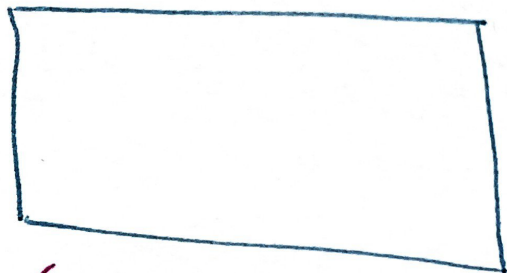
$$y - 2x + 3 = 0$$

$$AH = \frac{|A \text{ from } BC|}{BC} \rightarrow d = \frac{|9 - 2(3) + 3|}{\sqrt{4 + 4}} = \frac{6}{2\sqrt{2}} = \frac{3}{\sqrt{2}}$$

$$A(-1, 4)$$

5

$$B(3, 1)$$



$$\frac{5}{2}$$

$$D(-1, -1)$$

$$C(3, -1)$$

$$D(-1, -1)$$

$$C(3, -1)$$

② مجموع طول نقاط A و C با B و D برابر
و مجموع عرض نقاط A و C با B و D برابر است.

$$x-1 = \frac{3}{2} - m \rightarrow 2m = 3 \rightarrow m = \frac{3}{2}$$

$$AB \Rightarrow \frac{\Delta y}{\Delta x} = \frac{3}{-4} = -\frac{3}{4}$$

$$AD \perp AB \rightarrow AD \Rightarrow \frac{3}{4}x + b \rightarrow -\frac{4}{3}x + b = 4$$

$$\Rightarrow b = 4 + \frac{4}{3} = \frac{16}{3} \rightarrow AD = \frac{3}{4}x + \frac{16}{3}$$

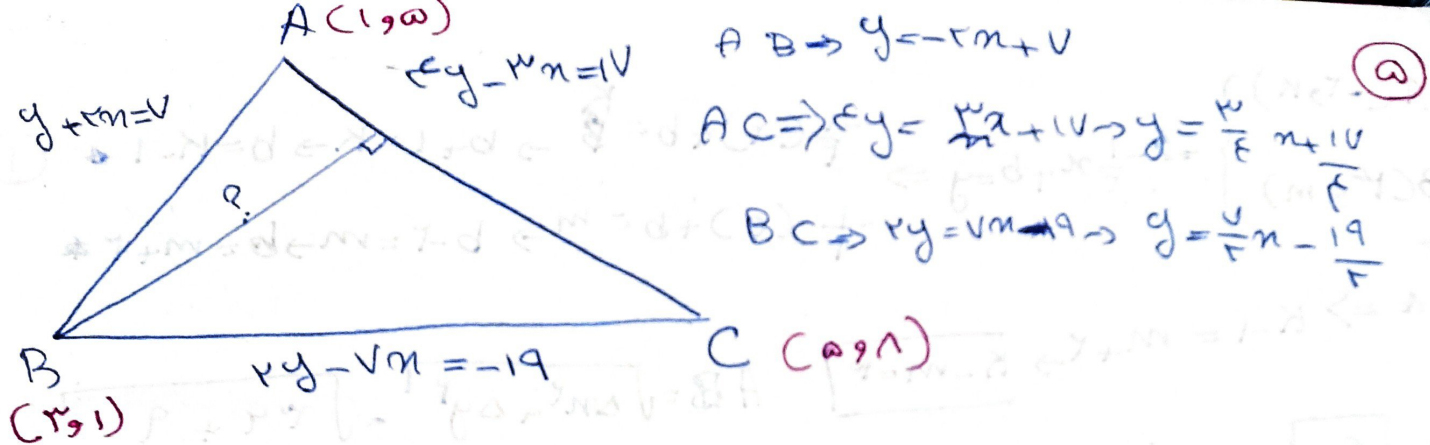
$$\frac{3}{4}x - \frac{5}{4} + \frac{16}{3} = \frac{4}{3} \Rightarrow x = -\frac{5}{2}$$

$$\Rightarrow y + 3 = 2 \rightarrow y = -1$$

$$BC \Rightarrow \sqrt{(3 - \frac{3}{2})^2 + (1 - (-1))^2} = \sqrt{\frac{9}{4} + 4} = \sqrt{\frac{25}{4}} = \frac{5}{2}$$

$$AB \Rightarrow \sqrt{4 + 16} = \sqrt{20} = 2\sqrt{5}$$

$$2P = 2(\frac{5}{2} + \frac{5}{2}) = 10 + 5 = 15$$



$$A \Rightarrow BA = AC \Rightarrow -2x + 7 = 2x + 1 \Rightarrow (2 + 2)x = 7 - 1 \Rightarrow 4x = 6 \Rightarrow x = \frac{3}{2}$$

$$\frac{11}{x} x = \frac{11}{x} \Rightarrow x = 1 \quad y = -2(1) + 7 = 5$$

$$B \Rightarrow AB = BC \Rightarrow -2x + 7 = 1 \Rightarrow -2x = 1 - 7 \Rightarrow -2x = -6 \Rightarrow x = 3$$

$$\Rightarrow \frac{11}{x} x = \frac{11}{x} \Rightarrow x = 3 \Rightarrow y = -2(3) + 7 = 1$$

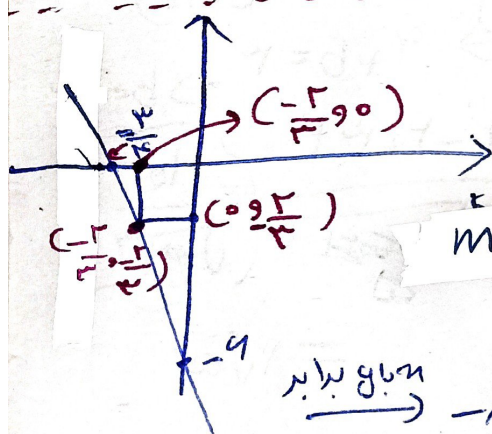
$$C \Rightarrow AC = BC \Rightarrow 2x + 1 = 1 \Rightarrow 2x = 0 \Rightarrow x = 0$$

$$\frac{11}{x} x = \frac{11}{x} \Rightarrow x = 0 \Rightarrow y = 2(0) + 1 = 1$$

$$AC = \frac{2}{x} \Rightarrow \frac{2}{x} x + b = y \Rightarrow \frac{2}{x} + b = 1 \Rightarrow b = 1 - \frac{2}{x} = \frac{x - 2}{x}$$

$$\Rightarrow AC = \frac{2}{x} x + \frac{x - 2}{x} \Rightarrow \frac{2x + x - 2}{x} = \frac{3x - 2}{x} = \frac{22}{5} = \frac{44}{10}$$

$$\Rightarrow 2y - 3x - 14 = 0 \Rightarrow (3, 1)$$



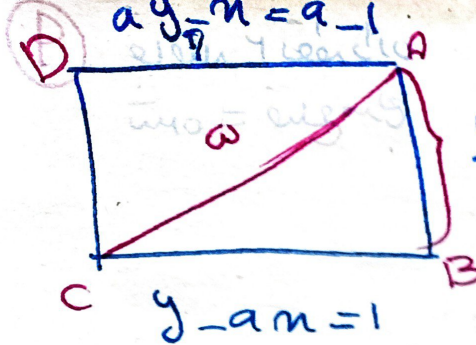
$$m = \frac{-4}{2} = -2$$

$$-2x - 4 = x \Rightarrow -3x = 4 \Rightarrow x = -\frac{4}{3}$$

$$\frac{4}{3} \sqrt{5} = \text{فاصله}$$

۶) فاصله بین دو خط موازی برابر است با فاصله از یک نقطه از یک خط به خط دیگر.
 به عبارتی دیگر فاصله از یک خط به خط دیگر برابر است با فاصله از یک نقطه از یک خط به خط دیگر.

$$y = -2x + b \Rightarrow y = -2x - 4$$



$$\frac{\sqrt{2}}{2}$$

$$y - ax = 1 \rightarrow y = ax + 1$$

$$a = \frac{1}{a} \rightarrow a^2 = 1 \rightarrow a = \pm 1$$

$$a - \frac{1}{a} \neq 1 \rightarrow a - 1 \neq a \rightarrow \text{جوابه } \checkmark$$

if $a = 1$ $\begin{cases} y_1 = x \rightarrow (1, 2) \times \\ y_2 = x + 1 \rightarrow (1, 3) \checkmark \end{cases} \Rightarrow a = 1 \checkmark$

if $a = -1$ $\begin{cases} y_1 = -x + 2 \rightarrow (1, 3) \times \\ y_2 = -x + 1 \rightarrow (1, 2) \times \end{cases}$

$AB \rightarrow \text{فاصله بین دو نقطه} \rightarrow \frac{|1 - 0|}{\sqrt{1 + 1}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

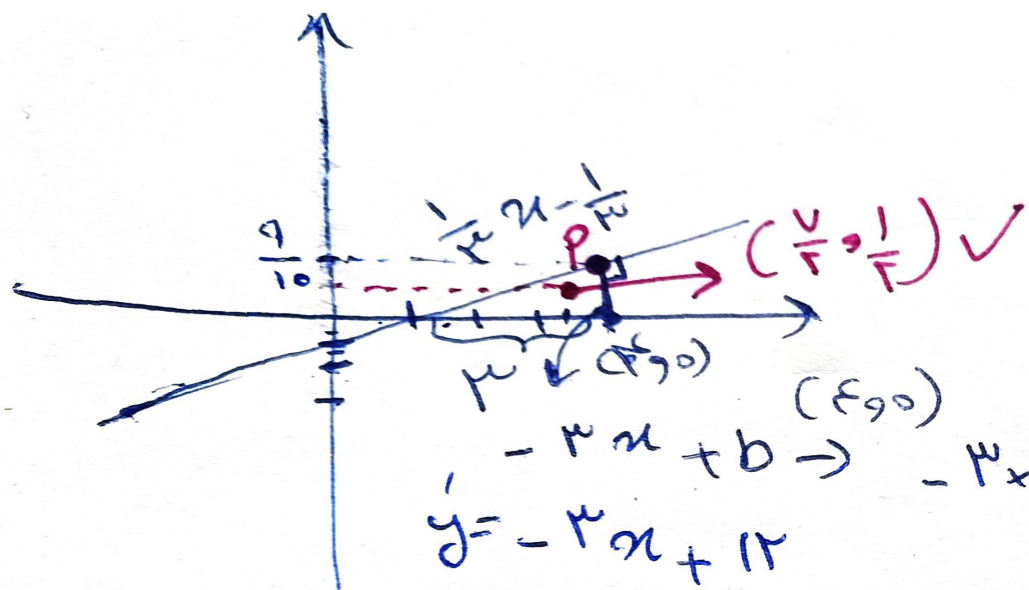
$$BC^2 = AC^2 - AB^2 = 2\omega - \frac{1}{2} = \frac{4\omega - 1}{2}$$

$$\Rightarrow BC = \frac{\sqrt{4\omega - 1}}{\sqrt{2}} \rightarrow S_{ABCD} = AB \cdot BC = \frac{\sqrt{2}}{2} \times \frac{\sqrt{4\omega - 1}}{\sqrt{2}} = \frac{\sqrt{4\omega - 1}}{2} = \boxed{\frac{\sqrt{2}}{2} \omega}$$

$$ay = x + (a - 1) \rightarrow y = \frac{1}{a}x + \frac{a - 1}{a} \quad \checkmark$$

خطوط موازی به نسبت
 برآیند

نقطه (۱ و ۲) باید در هر دو خط
 صدق کند



$$vy = n - 1 \rightarrow y = \frac{1}{v}n - \frac{1}{v} = 0$$

$$\frac{1}{v}n = \frac{1}{v} \rightarrow n = 1$$

$$-vn + b \rightarrow -v \times 1 + b = 0 \rightarrow b = 12$$

$$y = -vn + 12$$

$$P \Rightarrow -vn + 12 = \frac{1}{v}n - \frac{1}{v} \rightarrow (v + \frac{1}{v})n = 12 + \frac{1}{v}$$

$$\frac{10}{v}n = \frac{v}{v} \Rightarrow n = \frac{v}{10} = v \quad y = -vn + 12$$

$$= -v + v + 12 = -11 + 12 = 0,9$$

$$S = \frac{9}{10} \times v \times \frac{1}{v} = \frac{v}{10}$$

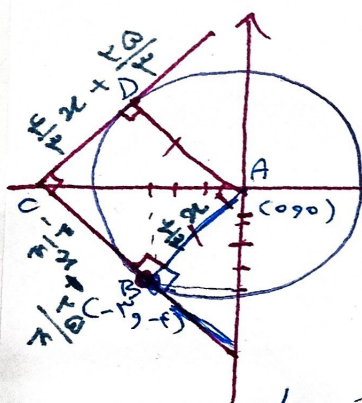
$$\Delta = \sqrt{3}x + C \quad \begin{cases} \xrightarrow{(-\frac{1}{\sqrt{3}}, a)} \sqrt{3}(-\frac{1}{\sqrt{3}}) + C = a \\ \xrightarrow{(-\frac{1}{\sqrt{3}}, b)} \sqrt{3}(-\frac{1}{\sqrt{3}}) + C = b \end{cases}$$

④ فاصله نقطه داره
شبه = ضلع مربع

$$\Rightarrow \left\{ \begin{array}{l} \rightarrow -\frac{\sqrt{3}}{2} + C = a \rightarrow C = a + \frac{\sqrt{3}}{2} \\ \rightarrow -\frac{\sqrt{3}}{2} + C = b \rightarrow C = b + \frac{\sqrt{3}}{2} \end{array} \right\} \rightarrow a + \frac{\sqrt{3}}{2} = b + \frac{\sqrt{3}}{2} \rightarrow b - a = \frac{\sqrt{3}}{2}$$

$$d = \sqrt{\left(-\frac{1}{\sqrt{3}} - (-\frac{1}{\sqrt{3}})\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2} = \sqrt{\frac{1}{3} + \frac{3}{4}} = \sqrt{\frac{4}{3} + \frac{3}{4}} = \sqrt{\frac{16}{12} + \frac{9}{12}} = \sqrt{\frac{25}{12}} = \frac{5}{2\sqrt{3}} = \frac{5\sqrt{3}}{6}$$

$\frac{1}{\sqrt{3}} \times \sqrt{3} = \frac{\sqrt{3}}{\sqrt{3}} = 1$ $\frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$ $a\sqrt{3} = \text{ضلع مربع}$



مربع $ABCD$ $m \in$ قرینه هکلووس

$$\sqrt{9+14} = a \rightarrow \text{عرض دایره (دایره) انزازه هر ضلع مربع}$$

$$m_{AB} = \frac{1}{\sqrt{3}} \rightarrow AB = \frac{1}{\sqrt{3}}x + b = \frac{1}{\sqrt{3}}x$$

$$BC = -\frac{1}{\sqrt{3}}x + b \xrightarrow{C(-\frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{3}})} +\frac{1}{\sqrt{3}}x + b = -\frac{1}{\sqrt{3}} \rightarrow$$

$$b = -\frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}} = -\frac{2}{\sqrt{3}} \rightarrow BC = -\frac{1}{\sqrt{3}}x - \frac{2}{\sqrt{3}}$$

* فاصله نقطه B از خط CD = ضلع مربع = a

$$CD = \frac{1}{\sqrt{3}}x + b = y \rightarrow 3y = x + 2b \rightarrow -x + 3y - 2b = 0 \rightarrow C(-\frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{3}})$$

$$d = \frac{|ax_0 + by_0 + c|}{\sqrt{a^2 + b^2}} = \frac{|1(-\frac{1}{\sqrt{3}}) - 1(-\frac{1}{\sqrt{3}}) - 2b|}{\sqrt{1+1}} = a \rightarrow |1 - 2b| = 2a$$

$$\Rightarrow \begin{cases} -2b = -2a \rightarrow b = \frac{2a}{2} = a \\ -2b = 2a \rightarrow b = -\frac{2a}{2} = -a \end{cases}$$

طبق سید عرفان
عشق
مربع $ABCD$

$$\frac{1}{\sqrt{3}}x + \frac{2a}{\sqrt{3}} = -\frac{1}{\sqrt{3}}x - \frac{2a}{\sqrt{3}} \rightarrow \left(\frac{1}{\sqrt{3}} + \frac{1}{\sqrt{3}}\right)x = -\left(\frac{2a}{\sqrt{3}} + \frac{2a}{\sqrt{3}}\right)$$

$$\frac{2a}{\sqrt{3}}x = -\frac{4a}{\sqrt{3}} \rightarrow 2ax = -4a \rightarrow x = -2$$

$$y = \frac{1}{\sqrt{3}}x + \frac{2a}{\sqrt{3}} \xrightarrow{x=-2} \frac{1}{\sqrt{3}}(-2) + \frac{2a}{\sqrt{3}} = -\frac{2}{\sqrt{3}} + \frac{2a}{\sqrt{3}} = -\frac{2}{\sqrt{3}} = -1$$

$$x + y = -2 - 1 = -3 = \boxed{V}$$