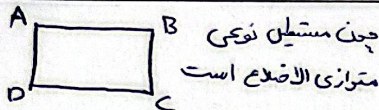


$$m = -\frac{1}{r} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{m - 1}{4 - (-2)} = -\frac{1}{r} \rightarrow m - 1 = -3$$

$$\text{فاصله نقطه از خط} = \sqrt{(Ax)^2 + (Ay)^2} = \sqrt{(4 - (-2))^2 + (m - 1)^2} = \sqrt{49} = 7$$

$$\text{مساحت مربع} = (\text{ضلع})^2 = (7\sqrt{2})^2 = 98$$



$$\Rightarrow x_A + x_C = x_B + x_D \Rightarrow -1 + x = 3 - 1 - x \Rightarrow x = \frac{3}{2}$$

$$m_{AB} = \frac{y_B - y_A}{x_B - x_A} = \frac{1 - 4}{\frac{3}{2} - (-1)} = -\frac{6}{5}$$

$$AB \perp BC \Rightarrow m_{BC} = -\frac{1}{m_{AB}} = \frac{5}{6} = \frac{y_C - y_B}{x_C - x_B}$$

$$\Rightarrow \frac{y - 1}{\frac{3}{2} - \frac{3}{2}} = \frac{5}{6} \rightarrow 3y - 3 = 4 - 12 \rightarrow y = -1$$

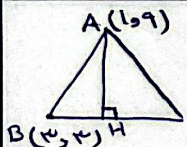
$$AB = \sqrt{(Ax)^2 + (Ay)^2} = \sqrt{19 + 9} = 5 \quad BC = \sqrt{(Ax)^2 + (Ay)^2} = \sqrt{\frac{9}{4} + 25} = \frac{5}{2}$$

$$\text{شیب} = \tan \alpha = \tan 40^\circ = \sqrt{3}$$

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

$$\rightarrow \sqrt{3} m^2 + r m - \sqrt{3} = 0 \rightarrow m^2 + r m - 3 = 0 \rightarrow m = \frac{1}{\sqrt{3}} \rightarrow m = \frac{r}{\sqrt{3}} = -\sqrt{3}$$

$$\text{افزایش} = \frac{1}{\sqrt{3}} - (-\sqrt{3}) = \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$$

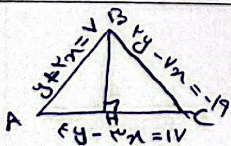


$$m_{CB} = \frac{y_C - y_B}{x_C - x_B} = \frac{11 - 3}{7 - 3} = 2$$

$$y = mx + b \quad m = 2 \quad 3 = 2(3) + b \rightarrow b = -3$$

$$\Rightarrow BC \text{ خط} \Rightarrow y = 2x - 3 \rightarrow 0y - 2x + 3 = 0$$

$$\text{فاصله نقطه از خط} = \frac{|ax + by + c|}{\sqrt{a^2 + b^2}} = \frac{|1 - 2(1) + 3|}{\sqrt{4 + 1}} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$$



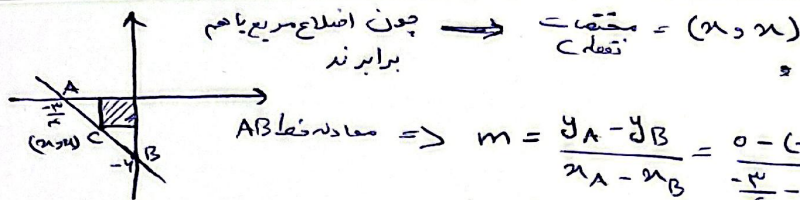
$$B \text{ نقطه} = 2 \text{ خط} \Rightarrow \frac{y - 9}{x - 1} = -2 \rightarrow y - 9 = -2x + 2 \rightarrow y = -2x + 11$$

$$BC \text{ خط} : y - 3 = 2(x - 3) \rightarrow y = 2x - 3$$

$$AB \text{ خط} : y - 9 = -2(x - 1) \rightarrow y = -2x + 11$$

$$y = 1$$

$$\text{فاصله نقطه از خط} = \frac{|ax + by + c|}{\sqrt{a^2 + b^2}} = \frac{|-2(3) + 11 - 9|}{\sqrt{4 + 1}} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$$



$$AB \text{ معادله خط } \Rightarrow m = \frac{y_A - y_B}{x_A - x_B} = \frac{0 - (-4)}{\frac{4}{\sqrt{2}} - 0} = -1$$

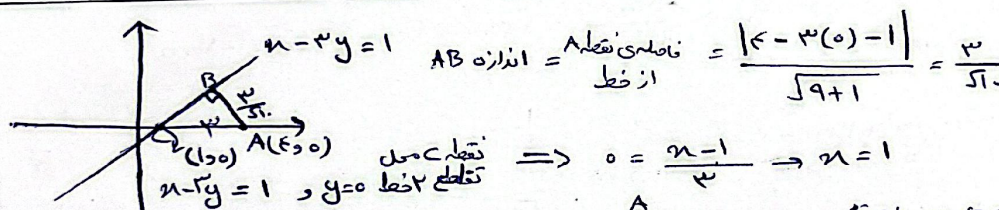
$$y = mx + b \xrightarrow{(0, -4)} y = -1x - 4 \xrightarrow{\text{نقطه روی خط } AB} x = -1x - 4 \rightarrow x = -\frac{4}{2} = -2$$

$$\text{فاصله از مبدأ مختصات} = \sqrt{(5x)^2 + (4y)^2} = \sqrt{\frac{4}{9} + \frac{4}{9}} = \frac{2\sqrt{2}}{3}$$

$$\begin{aligned} a'y - x &= a - 1 \rightarrow m = \frac{1}{a} \\ y &= ax + 1 \rightarrow m' = a \end{aligned} \quad \left. \begin{array}{l} \text{موازی} \\ \text{چون} \\ \text{موازی} \end{array} \right\} m = m' \rightarrow \frac{1}{a} = a \rightarrow a^2 = 1 \rightarrow a = \pm 1$$

$$\boxed{a=1} \rightarrow \begin{aligned} y - x &= 0 \\ y - x &= 1 \end{aligned} \quad \begin{aligned} &\text{نقطه } (1, 1) \\ &\text{رابطه خط } y - x = 1 \end{aligned} \quad \begin{aligned} &y - 1 \neq 0 \quad \alpha \\ &y - 1 = 1 \quad \checkmark \end{aligned} \quad \begin{aligned} &a = -1 \rightarrow -y - x = -2 \quad \text{نقطه } (1, 1) \\ &y + x = 1 \quad \text{رابطه خط } y + x = 1 \end{aligned} \quad \begin{aligned} &-2 - 1 \neq -2 \quad \alpha \\ &-2 + (-1) \neq -2 \quad \alpha \end{aligned}$$

$$\begin{aligned} &\text{مساحت مستطیل} = (AB) \times (AD) = \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = \frac{1}{2} \\ &\text{فاصله از مبدأ مختصات} = \sqrt{\left(\frac{\sqrt{2}}{2}\right)^2 + \left(\frac{\sqrt{2}}{2}\right)^2} = \frac{\sqrt{2}}{2} \end{aligned}$$



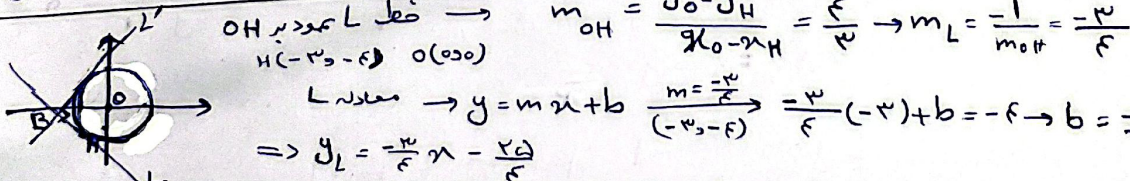
$$\begin{aligned} &\text{فاصله از مبدأ مختصات} = \frac{|1 - 2(0) - 1|}{\sqrt{1 + 4}} = \frac{0}{\sqrt{5}} = 0 \\ &\text{فاصله از مبدأ مختصات} = \frac{|1 - 2(0) - 1|}{\sqrt{1 + 4}} = \frac{0}{\sqrt{5}} = 0 \end{aligned}$$

$$\Rightarrow AB = \frac{9}{\sqrt{5}} \quad \text{مساحت} = \frac{AB \times BC}{2} = \frac{\frac{9}{\sqrt{5}} \times \frac{9}{\sqrt{5}}}{2} = \frac{81}{10}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{a - b}{\frac{1}{2} + \frac{1}{2}} = \sqrt{3} \rightarrow a - b = \frac{-\sqrt{3}}{4}$$

$$\text{فاصله از مبدأ مختصات} = \sqrt{(5x)^2 + (4y)^2} = \sqrt{\frac{1}{4} + \frac{9}{4}} = \frac{5}{2}$$

$$\text{فاصله از مبدأ مختصات} = \sqrt{(5x)^2 + (4y)^2} = \sqrt{\frac{1}{4} + \frac{9}{4}} = \frac{5}{2}$$



$$\begin{aligned} &\text{فاصله از مبدأ مختصات} = \sqrt{(5x)^2 + (4y)^2} = \sqrt{9 + 14} = 5 \\ &\text{فاصله از مبدأ مختصات} = \sqrt{(5x)^2 + (4y)^2} = \sqrt{9 + 14} = 5 \end{aligned}$$

$$\begin{aligned} &\text{فاصله از مبدأ مختصات} = \sqrt{(5x)^2 + (4y)^2} = \sqrt{9 + 14} = 5 \\ &\text{فاصله از مبدأ مختصات} = \sqrt{(5x)^2 + (4y)^2} = \sqrt{9 + 14} = 5 \end{aligned}$$