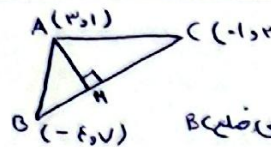


$$A(-4, 1) \quad B(3, 1) \rightarrow \text{شیب } m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - (-4)}{3 - (-4)} = -1 \rightarrow \text{شیب عمود } m' = \frac{1}{1} = 1$$

$$M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) \Rightarrow M\left(\frac{-4 + 3}{2}, \frac{1 + 1}{2}\right) \Rightarrow M\left(-\frac{1}{2}, 1\right)$$

معادله عمود منتهی: $y = m'x + b$ $\frac{m' = 1}{M(-\frac{1}{2}, 1)} \rightarrow 1 = \frac{1}{1}x + b \rightarrow b = \frac{3}{2} \rightarrow y = \frac{1}{1}x + \frac{3}{2}$



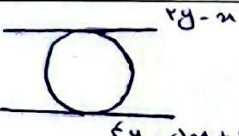
$$A(3, 1) \quad C(-1, 3) \quad \text{طول BC: } \sqrt{\Delta x^2 + \Delta y^2} = \sqrt{(-1 - (-4))^2 + (3 - 1)^2} = \sqrt{10}$$

$$B(-4, 1) \quad \text{میدانی ضلع BC} \Rightarrow m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 3}{-4 - (-1)} = \frac{-2}{-3} = \frac{2}{3}$$

$$y = mx + b \rightarrow 1 = \frac{2}{3}(-4) + b \rightarrow b = \frac{11}{3}$$

$$\text{طول ارتفاع AH} = \frac{|ax + by + c|}{\sqrt{a^2 + b^2}} = \frac{|\frac{2}{3}x - y + \frac{11}{3}|}{\sqrt{(\frac{2}{3})^2 + 1}} = \frac{|\frac{2}{3}(3) - 1 + \frac{11}{3}|}{\sqrt{\frac{13}{9}}} = \frac{4}{\sqrt{13}} = \frac{4\sqrt{13}}{13}$$

$$\text{طول ارتفاع BC} = \text{طول ارتفاع AH} = \frac{4\sqrt{13}}{13}$$

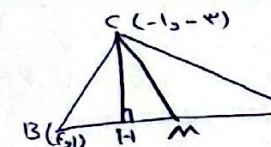


$$y - x = 2 \Rightarrow \begin{cases} y - x = 2 \rightarrow (y - 2) = x \\ y - x = 2 \rightarrow y - 2 = x \end{cases}$$

$$y = ax + 2 \quad \text{ضلع موازی} \Rightarrow \frac{a}{a'} = \frac{b}{b'} \Rightarrow \frac{a}{1} = \frac{2}{-1} \Rightarrow a = -2$$

$$\text{تکراهی به ضلع موازی} = \frac{|c - c'|}{\sqrt{a^2 + b^2}} = \frac{|2 - (-2)|}{\sqrt{1 + 4}} = \frac{4}{\sqrt{5}} = \frac{4\sqrt{5}}{5}$$

$$\text{مساحت دایره} = \pi r^2 = \pi (2)^2 = 4\pi$$



$$C(-1, 3) \quad \text{میدانی ضلع AB: } M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) \Rightarrow M\left(\frac{3 + (-4)}{2}, \frac{1 + 1}{2}\right) \Rightarrow M\left(-\frac{1}{2}, 1\right)$$

$$A(3, 1) \quad \text{میدانی ضلع BC} \rightarrow m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 3}{3 - (-1)} = -\frac{1}{2}$$

$$y = mx + b \rightarrow 1 = -\frac{1}{2}(3) + b \rightarrow b = \frac{5}{2}$$

$$\text{میدانی ضلع AC} \rightarrow m' = \frac{1}{2} \rightarrow y = \frac{1}{2}x + b \rightarrow 3 = \frac{1}{2}(3) + b \rightarrow b = \frac{9}{2}$$

$$\text{طول ارتفاع H} = \frac{|ax + by + c|}{\sqrt{a^2 + b^2}} = \frac{|\frac{1}{2}x - y + \frac{9}{2}|}{\sqrt{(\frac{1}{2})^2 + 1}} = \frac{4}{\sqrt{5}} = \frac{4\sqrt{5}}{5}$$

$$m' = \frac{1}{m} \rightarrow m' = -2$$

$$(m - 2)x + (2 - m)y - 1 = 0 \rightarrow m = \frac{-2m + 2}{2 - m}$$

$$(m + 1)x - (2m - 4)y + 1 = 0 \rightarrow m' = \frac{m + 1}{2m - 4}$$

$$\Delta = 149 - 340 < 0 \rightarrow \text{به ازای هیچ مقدار m خط برهم عمود نیست}$$

