

سوال 1

$A(4, -4), B(2, 1)$

شیب دایره از A و B: $\frac{1+4}{2-4} = -\sqrt{3} \rightarrow m = \frac{1}{\sqrt{3}} \quad y = ax + b \rightarrow y = \frac{1}{\sqrt{3}}x + b$
 (4, -4) $\rightarrow -4 = \frac{1}{\sqrt{3}}(4) + b \rightarrow b = -\frac{16}{\sqrt{3}}$
 $y = \frac{1}{\sqrt{3}}x - \frac{16}{\sqrt{3}}$
 $M_{AB} = (\frac{4+2}{2}, \frac{-4+1}{2}) = (3, -1.5)$

$A(4, 1), B(-4, 7), C(-1, 3)$

سوال 2

$\overline{BC} = \sqrt{(-4-1)^2 + (7-3)^2} = 5$

شیب دایره $\rightarrow m = \frac{7-3}{-4-1} = -\frac{4}{5} \rightarrow y = -\frac{4}{5}x + b$
 (-1, 3) $\rightarrow 3 = -\frac{4}{5}(-1) + b \rightarrow b = \frac{19}{5} \rightarrow y = -\frac{4}{5}x + \frac{19}{5}$
 $\overline{AH} = \frac{|1 + \frac{19}{5} - \frac{4}{5}|}{\sqrt{1 + \frac{16}{25}}} = \frac{\frac{16}{5}}{\frac{5}{5}} = \frac{16}{5}$
 $\overline{BC} - \overline{AH} = 5 - \frac{16}{5} = \frac{9}{5}$

$xy - x = \sqrt{x^2} \rightarrow xy - x = 1 \rightarrow xy - x = 1$

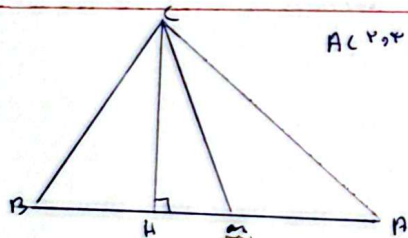
سوال 3

$xy = ax + 1 \rightarrow xy - ax = 1 \rightarrow a = x$

مساحت دایره: $\frac{|1 \cdot 1 - 1|}{\sqrt{(1)^2 + (-1)^2}} = \frac{0}{\sqrt{2}} = 0$

شعاع دایره $\rightarrow 0, 4\sqrt{2}$

$S_{\text{دایره}} = \pi r^2 \rightarrow \pi \times (\frac{4\sqrt{2}}{2})^2 = 16\pi$



$A(4, 3), B(8, 1), C(-1, -3)$

سوال 4

نامت نقطه M از H = نامت نقطه M از A و B

$m_{AB} = \frac{3-1}{4-8} = -\frac{1}{2} \rightarrow m_{CH} = 2$
 $y = 2x + b \xrightarrow{(-1, -3)} -3 = 2(-1) + b \rightarrow b = -1 \rightarrow y = 2x - 1$
 $\overline{MH} = \frac{|2 \cdot 4 - 1 - 3|}{\sqrt{2^2 + 1}} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

$(m+1)x - (2m-5)y + 1 = 0 \rightarrow (3m-4)x + (5-m)y - 1 = 0$

سوال 5

مستقیمها موازی $\rightarrow m \times m' = -1$

$\frac{-(m+1)}{-(3m-4)} \times \frac{-(5-m)}{5-m} = -1 \Rightarrow \frac{-m-1}{3m-4} = \frac{5-m}{5-m} \rightarrow 3m^2 - 13m + 4 = 0$

$\Delta = 149 - 360$

مجموع مختصات نقطه قبل از تقاطع

$$\begin{aligned} AB: x+2y &= 4 \\ AC: y &= 2x-1 \\ BC: x+y &= 5 \end{aligned} \quad \xrightarrow{A: \text{مركز دایره}} \quad \begin{aligned} 2y &= 4-x \\ y &= 2x-1 \\ 4-x &= 2x-1 \end{aligned}$$

$$A(1,1) \quad B(4,1) \quad C(1,4)$$

$$AM = \sqrt{(1-\frac{1+4}{2})^2 + (1-\frac{1+4}{2})^2} = \frac{\sqrt{2}}{2}$$

$$\begin{aligned} y &= 2x-1 \\ y &= -x+5 \end{aligned}$$

$$2x-1 = -x+5 \Rightarrow 3x = 6 \Rightarrow x = 2, y = 9$$

$$A(1,1) \quad B(4,1) \quad C(1,4)$$

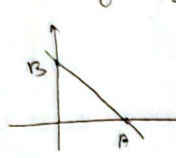
$$m_{BC} = \frac{4-1}{1-4} = -1$$

$$y = -x+b \Rightarrow -1 = -1(4)+b \Rightarrow b = 3 \Rightarrow y = -x+3$$

$$AH = \frac{|1+1-5|}{\sqrt{2}} = \frac{3}{\sqrt{2}}$$

$$M = (\frac{\frac{10}{2}+0}{2}, \frac{\frac{10}{2}-1}{2}) = (\frac{5}{2}, \frac{4}{2}) \Rightarrow AM = \sqrt{(1-\frac{5}{2})^2 + (1-2)^2} = \frac{\sqrt{5}}{2}$$

$$\frac{AM}{AH} = \frac{\frac{\sqrt{5}}{2}}{\frac{3}{\sqrt{2}}} = \frac{\sqrt{10}}{6}$$

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


$$A(10,0) \quad B(0,5)$$

$$AB = \sqrt{100+25} = 5\sqrt{5}$$

$$\begin{aligned} 1: m_1 y - 5x &= 2m \Rightarrow y = \frac{5}{m}x + 2 \\ 2: y + m_2 &= x+2 \Rightarrow y = (1-m)x + 2 \end{aligned} \quad \rightarrow \quad \begin{aligned} x=0 &\Rightarrow y=2 \\ y=0 &\Rightarrow x=2 \end{aligned}$$

$$\begin{aligned} 1: y=0 &\Rightarrow x = -\frac{2}{m} \\ 2: y=0 &\Rightarrow x = \frac{2}{1-m} \end{aligned}$$

$$S_{\text{مربع}} = \frac{1}{4} \times \text{طول ضلع} \times \text{طول ضلع} \times \sin 90^\circ \rightarrow \frac{1}{4} = \frac{1}{4} \times \left| \frac{m}{1-m} - \frac{2}{1-m} \right| \Rightarrow \left| \frac{m}{1-m} - \frac{2}{1-m} \right| = 1$$

$$\frac{m}{1-m} - \frac{2}{1-m} = 1 \Rightarrow \frac{m-2}{1-m} = 1 \Rightarrow m-2 = 1-m \Rightarrow 2m = 3 \Rightarrow m = \frac{3}{2}$$

$$\frac{m}{1-m} - \frac{2}{1-m} = -1 \Rightarrow \frac{m+1}{1-m} = 1 \Rightarrow m+1 = 1-m \Rightarrow 2m = 0 \Rightarrow m = 0$$

$$m = \frac{3}{2} \quad m = -1 \pm \sqrt{5} \quad m = -1 - \sqrt{5} \quad \text{محيط مربع} = 4 \times (-1 - \sqrt{5}) = -4 - 4\sqrt{5}$$

$$y = 2x-4 \quad M(2,-2)$$

$$A(2,1)$$

$$m_{AA'} = \frac{y_{A'}+4}{x_{A'}} = -2 \Rightarrow y_{A'} = -2x_{A'}-4$$

$$y = 2x-4 \quad y = -2x-4$$

$$y = x+5 \quad A(1,2)$$

$$m_{AA'} = -1 \Rightarrow y = -x+b \Rightarrow 2 = -1+b \Rightarrow b = 3 \Rightarrow y = -x+3$$

$$\begin{aligned} y &= x+5 \\ y &= -x+3 \end{aligned}$$

$$m_B = \frac{x_B+x_{B'}}{y} \Rightarrow -1 = \frac{1+x_{B'}}{2} \Rightarrow x_{B'} = -3 = a$$

$$m_B = \frac{y_B+y_{B'}}{y} \Rightarrow 2 = \frac{2+y_{B'}}{2} \Rightarrow y_{B'} = 2 = b$$

$$y_B - a = 2 - (-3) = 5$$