

$$A(2, -2) \text{ و } B(2, 8)$$

سوال ۱:

• A را به این شکل $\frac{1+y}{x-2}$ $x = \frac{1}{y}$ $y = \frac{1}{x}$ $y = \frac{1}{x} + b \rightarrow y = \frac{1}{x} + b \xrightarrow{(2,1)} 1 = \frac{1}{2} + b \Rightarrow b = \frac{1}{2}$

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

$$AB \left(\frac{2+\frac{1}{2}}{\frac{1}{2}}, \frac{1-2}{\frac{1}{2}} \right) \Rightarrow (3, 1)$$

سوال ۲:

$$A(2, 1) \quad B(-2, 5) \quad C(-1, 3)$$

$$C: \sqrt{(-3)^2 + (2)^2} = 5$$

C را به این شکل $m = \frac{y-5}{x+1} = \frac{-2-5}{-1+1}$ $y = \frac{-2-5}{-1+1}x + b \xrightarrow{(-1,3)} 3 = \frac{-2-5}{-1+1}(-1) + b \rightarrow b = \frac{5}{4}$

$$H = \frac{|1+5-\frac{5}{4}|}{\sqrt{1+\frac{16}{9}}} = \frac{\frac{1}{4}}{\frac{5}{3}} = \frac{3}{20}$$

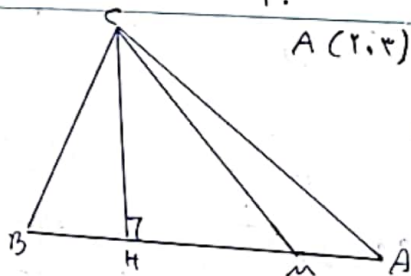
$$BC - AH = 5 - 2 = 3$$

$xy - x = 1 \xrightarrow{x=1} y - 1 = 1 \Rightarrow y = 2$ $xy - x = 1 \Rightarrow y - 1 = \frac{1}{x} \Rightarrow y = \frac{1}{x} + 1$

فاصله نقطه از خط $\frac{|1-2|}{\sqrt{1^2 + (-1)^2}} = \frac{1}{\sqrt{2}} = \frac{1\sqrt{2}}{2} = \frac{\sqrt{2}}{2}$

سوال ۳:

$s = \pi r^2 \rightarrow \pi \times (\frac{4\sqrt{5}}{1})^2 = 11\pi$



$$A(2, 4) \quad B(5, 1) \quad C(-1, -3)$$

$$m_{AB} = \frac{4-1}{2-5} = \frac{3}{-3} = -1 \rightarrow m_{CH} = 1$$

فاصله نقطه M از H = فاصله M از پاره خط CH

$$y = x + b \xrightarrow{(-1, -3)} -3 = -1 + b \rightarrow b = -2$$

$$m_{CH} = \frac{|2-3+2|}{\sqrt{1}} = \frac{1}{1} = 1$$

$$\left(\frac{5+2}{2}, \frac{1+4}{2} \right) = (3.5, 2.5)$$

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

سوال ۵:

فاصله نقطه از خط $m \perp m' \Rightarrow m \cdot m' = -1$

$$\frac{-(m+1)}{-(2m-5)} \cdot \frac{-(3m-2)}{5-m} = -1 \Rightarrow \frac{m+1}{2m-5} = \frac{3m-2}{5-m} \rightarrow 2m^2 - 16m + 12 = 3m^2 - 3m + 2$$

$$\Rightarrow m^2 - 13m + 14 = 0$$

$\Delta = 179 - 34 = 145 \rightarrow \Delta < 0$

$$\begin{cases} AB: x+y=3 \\ AC: y=2x-1 \\ BC: 2x+y=5 \end{cases} \rightarrow \begin{cases} y=3-x \\ y=2x-1 \end{cases}$$

$$\begin{aligned} 3-x &= 2x-1 \\ 3 &= 3x-1 \\ 4 &= 3x \\ x &= \frac{4}{3} \\ y &= 3 - \frac{4}{3} = \frac{5}{3} \end{aligned}$$

$$y = 2x - 1 \quad A(1, 1) \quad B(\frac{5}{2}, \frac{3}{2}) \quad C(5, -1)$$

سوال ۲:

$$y = 2x - 1$$

$$y = -x + 1$$

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

$$x + y = 3$$

$$x + y = 1$$

$$-x + 2 = -2x + 1$$

$$x = 0$$

فاصله نقطه از خط $\frac{|\frac{5}{2} + \frac{3}{2} - 1|}{\sqrt{1^2 + 1^2}} = \frac{3}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$

فاصله نقطه از خط $\frac{|\frac{5}{2} - 1 - 1|}{\sqrt{1^2 + 1^2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$$AH = \frac{|1 + (-\epsilon)|}{\sqrt{2}} = \frac{1 - \epsilon}{\sqrt{2}} = \sqrt{2}$$

$$M = \left(\frac{\frac{A}{r} + 0}{r}, \frac{\frac{V}{r} - 1}{r} \right) = \left(\frac{1}{r}, \frac{r}{r} \right) \rightarrow AM = \sqrt{\left(1 - \frac{1}{r}\right)^2 + \left(1 - \frac{r}{r}\right)^2} = \frac{\omega \sqrt{2}}{r}$$

$$\frac{AM}{AH} = \frac{\frac{\omega \sqrt{2}}{r}}{\frac{1 - \epsilon}{\sqrt{2}}} = \left[\frac{\omega}{r} \right]$$

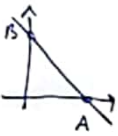
سوال ۷:

$$y = -\frac{1}{r}x + b \rightarrow x = 0 \rightarrow y = b$$

$$\rightarrow y = 0 \rightarrow x = rb$$

$$A: (1, 0) \quad B: (0, \omega)$$

$$AB = \sqrt{1 + \omega^2} = \sqrt{1 + 0} = \omega \sqrt{2}$$



$$\text{فاصله نقطه از خط} = \frac{|0 + 0 - b|}{\frac{\sqrt{2}}{r}} = \sqrt{2} \rightarrow 2|-b| = 1 \rightarrow |-b| = \frac{1}{2} \rightarrow b = \pm \frac{1}{2}$$

فاصله بین دو خط موازی $AB = \frac{b_2 - b_1}{\sin \theta}$

سوال ۸:

$$① \quad my - \epsilon n = r \rightarrow y = \frac{\epsilon}{m}n + \frac{r}{m}$$

$$② \quad y + m = r \rightarrow y = r - m$$

مرد فقط می‌تواند
در دو حالت قرار بگیرد
در دو حالتی که

$$① \quad خط \rightarrow y = 0 \rightarrow x = -\frac{1}{r}m$$

$$② \quad خط \rightarrow y = 0 \rightarrow x = \frac{r}{1-m}$$

$$\Delta = \frac{1}{r} \alpha \text{ نقطه از خط موازی} \rightarrow \frac{\Delta}{r} = \frac{1}{r} \alpha \left| \frac{m}{r} - \frac{r}{1-m} \right| \rightarrow \left| \frac{m}{r} - \frac{r}{1-m} \right| = \frac{\Delta}{r}$$

$$① \quad \Delta = 0 \Rightarrow \frac{m}{r} - \frac{r}{1-m} = 0 \rightarrow \frac{m - r}{r} = 0 \rightarrow m = r$$

$$② \quad \Delta = 0 \Rightarrow \frac{m}{r} - \frac{r}{1-m} = 0 \rightarrow m + \Delta = \frac{r}{1-m} \Rightarrow (m + \Delta)(1 - m) = r \rightarrow m^2 - \epsilon m + \Delta = 0 \rightarrow m = r$$

$$\rightarrow m = r \quad m = -r + \sqrt{0} \quad m = -r - \sqrt{0} \rightarrow \text{فاصله بین دو خط موازی} = \frac{b_2 - b_1}{\sin \theta} = \frac{(-r + \sqrt{0}) - (-r - \sqrt{0})}{\sin \theta} = \frac{2\sqrt{0}}{\sin \theta}$$

$$\rightarrow m = r \quad m = -r + \sqrt{0} \quad m = -r - \sqrt{0} \rightarrow \text{فاصله بین دو خط موازی} = \frac{b_2 - b_1}{\sin \theta} = \frac{(-r + \sqrt{0}) - (-r - \sqrt{0})}{\sin \theta} = \frac{2\sqrt{0}}{\sin \theta}$$

سوال ۹:

$$y = rx - r \quad m(r, -r)$$

$$\text{نقطه از خط موازی} \rightarrow A(r, 1)$$

$$\frac{rA' + r}{r} = r \rightarrow rA' = r^2 \rightarrow \frac{rA' + 1}{r} = r \rightarrow rA' = r^2 - 1$$

$$n' = y = rx + b$$

$$\left(\frac{r}{\sqrt{2}} \right) - \frac{\Delta}{r} = \frac{r(r) + b}{\sqrt{2}r - 1}$$

سوال ۱۰:

$$y = x + \Delta \rightarrow A(1, \omega)$$

$$m_{AB} = -1 \rightarrow y = -x + b \rightarrow r = -1 + b \rightarrow b = r + 1 \rightarrow y = -x + r + 1$$

$$y = x + 0$$

$$y = -x + r$$

$$x = -1 \rightarrow y = r \rightarrow B(-1, r)$$

$$m_B = \frac{rA + rA'}{r} = -1 \rightarrow \frac{1 + rA'}{r} = -1 \rightarrow rA' = -r - 1$$

$$y_B = \frac{rA + rA'}{r} = r \rightarrow \frac{r + rA'}{r} = r \rightarrow rA' = r^2 - r$$

$$r(b - a) = 1 + r = 0$$