

$$\text{مستقیم } M \begin{cases} 3 \\ 1 \end{cases}, m = \frac{1+9}{-2} = -5 \rightarrow m' = \frac{1}{5} \Rightarrow y = m'x + b \quad (1)$$

$$\hookrightarrow y = \frac{1}{5}x + b \xrightarrow{1} 1 = \frac{1}{5} + b \rightarrow b = \frac{4}{5} \Rightarrow y = \frac{1}{5}x + \frac{4}{5}$$

$$BC = \sqrt{\Delta y^2 + \Delta x^2} = \sqrt{4+16} = \omega, m_{BC} = \frac{V-1^u}{-2+1} = \frac{-4}{1} \quad (2)$$

$$y = \frac{-4}{1}x + b \xrightarrow{1^u} \frac{-4}{1}x + b = 1 \rightarrow \frac{\omega}{1} = b \Rightarrow y = \frac{-4}{1}x + \frac{\omega}{1} \rightarrow 4x + \omega - \omega = \dots$$

$$\hookrightarrow AH = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}} = \frac{|1 \cdot 1 + 1 \cdot \omega - \omega|}{\sqrt{4+16}} = \frac{1}{\omega} = 2 \rightarrow BC - AH = 3$$

$$\text{شیب } \rightarrow m = m' \rightarrow \begin{cases} 4y - ax - 2 = 0 \\ 4y - 2x - 14 = 0 \end{cases} \Rightarrow a = 2$$

$$\text{فاصله } d = \frac{|c - c'|}{\sqrt{a^2 + b^2}} \Rightarrow \frac{|-2 - 14|}{\sqrt{16 + 4}} = \frac{16}{\sqrt{20}} = 2\sqrt{2} \rightarrow r = \frac{2\sqrt{20}}{\omega}$$

$$S = \pi r^2 = \frac{4R}{\omega}$$

$$AB \text{ م } \begin{cases} 3 \\ 1 \end{cases}, M_{AB} = \frac{1}{-1} = -1 \rightarrow M_{HC} = 1 \Rightarrow y = ax + b \Rightarrow y = x + b \quad (3)$$

$$\hookrightarrow \begin{cases} 1 \\ -1 \end{cases} \rightarrow -1 + b = -3 \Rightarrow b = -2 \Rightarrow y = x - 2 \rightarrow y - x + 2 = 0$$

$$d = \frac{|-x_1 + y_1 + 2|}{\sqrt{1+1}} \xrightarrow{1^u} \frac{|-3 + 1 + 2|}{\sqrt{1+1}} = \frac{\sqrt{2}}{2}$$

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$$(a-m)y + (1-m-x)z - v = 0 \Rightarrow a = \frac{-1-m+x}{a-m} \rightarrow \text{محل تقاطع دو خط}$$

$$-(1-m-x)y + (m+1)z + 1 = 0 \Rightarrow a' = \frac{m+1}{1-m-x} \rightarrow \text{محل تقاطع دو خط}$$

$$\frac{-1-m+x}{a-m} = \frac{m+1}{-m-1} \rightarrow -1-m+x = 1+m+x \Rightarrow -1-m+x = 1+m+x$$

$$\rightarrow a-m-x = 1+m+x \Rightarrow \Delta = (1-m)^2 - f(a)(1) < 0 \Rightarrow \text{دو خط موازی و متمم هستند}$$

$$AC \text{ و } AB \text{ برقرارند } A \rightarrow \begin{cases} x+2y=3 \\ 2y-4x=-2 \end{cases} \rightarrow x=1, y=1 \Rightarrow A \left| \begin{matrix} 1 \\ 1 \end{matrix} \right|$$

$$BC \text{ و } AB \text{ برقرارند } B \rightarrow \begin{cases} x+2y=3 \\ x+y=4 \end{cases} \rightarrow y=-1, x=5 \Rightarrow B \left| \begin{matrix} 5 \\ -1 \end{matrix} \right|$$

$$BC \text{ و } AC \text{ برقرارند } C \rightarrow \begin{cases} y-2x=-1 \\ x+y=4 \end{cases} \rightarrow x=\frac{5}{3}, y=\frac{7}{3} \Rightarrow C \left| \begin{matrix} \frac{5}{3} \\ \frac{7}{3} \end{matrix} \right|$$

$$BC \text{ وسط } M \left| \begin{matrix} \frac{5}{3} \\ \frac{7}{3} \end{matrix} \right| \rightarrow AM = \sqrt{\left(\frac{5}{3}-1\right)^2 + \left(\frac{7}{3}-1\right)^2} = \sqrt{\frac{a^2}{9}} = \frac{a\sqrt{2}}{3}$$

$$AH = \frac{|1+1-4|}{\sqrt{1+1}} = \sqrt{2} \Rightarrow \frac{AM}{AH} = \frac{a}{3}$$

$$\text{فاصله از مرکز} \rightarrow \sqrt{2} = \frac{|ax_1+by_1+c|}{\sqrt{a^2+b^2}} \quad y = \frac{1}{2}x + c \quad \frac{|c|}{\frac{\sqrt{2}}{2}} \Rightarrow |c| = \frac{\sqrt{2}}{2} = a$$

$$\begin{cases} c=a \\ c=-a \end{cases} \Rightarrow \begin{cases} 0 = -\frac{1}{2}x + a \Rightarrow x=2 \\ 0 = -\frac{1}{2}x - a \Rightarrow x=-2 \end{cases} \Rightarrow AB = \sqrt{1+4a^2} = a\sqrt{5}$$

$$\begin{cases} c=a \\ c=-a \end{cases} \Rightarrow \begin{cases} 0 = -\frac{1}{2}x + a \Rightarrow x=2 \\ 0 = -\frac{1}{2}x - a \Rightarrow x=-2 \end{cases}$$

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معمولی

$$my - kx = ym \rightarrow y = \frac{f}{m}x + 1 \rightarrow \text{خط } A \begin{vmatrix} 0 \\ y \\ 0 \end{vmatrix}$$

$$y + mx = x + 1 \rightarrow y = (1-m)x + 1 \rightarrow \text{خط } B \begin{vmatrix} 0 \\ y \\ 0 \end{vmatrix}$$

$$\begin{cases} \rightarrow 0 = \frac{f}{m}x_B + 1 \Rightarrow x_B = -\frac{m}{f} \\ \rightarrow 0 = (1-m)x_C + 1 \Rightarrow x_C = \frac{1}{m-1} \end{cases} \rightarrow A \begin{vmatrix} 0 \\ y \\ 0 \end{vmatrix}, B \begin{vmatrix} -\frac{m}{f} \\ y \\ 0 \end{vmatrix}, C \begin{vmatrix} \frac{1}{m-1} \\ y \\ 0 \end{vmatrix}$$

$$S = \frac{|x_B - x_C| \times 1}{f} = \frac{\Delta}{f} = \left| \frac{1}{m-1} + \frac{m}{f} \right| \Rightarrow \frac{f + m^2 - m}{f(m-1)} = \frac{\Delta}{f}$$

$$\rightarrow m^2 - m + f = \Delta m - \Delta \Rightarrow m^2 - 4m + 4 = 0 \Rightarrow m = 2$$

$$\rightarrow -\Delta m + \Delta = m^2 - m + f \Rightarrow m^2 + fm - 1 = 0 \text{ هر دو } \rho = -1 \left(\frac{c}{a} = -1 \right)$$

$$\Rightarrow \text{طول موجها} = 1 \times (-1) = -1$$

$$m \text{ موجها} = f - \frac{c + 1}{f} = -1 \Rightarrow c + 1 = 1f \Rightarrow c = 0$$

$$d_1 = y = 2x - 1, d_2 = y = 2x - \frac{c+1}{f} \xrightarrow{\text{دو خط}} d_2 = y = 2x - \frac{c+1}{f}$$

$$c = \frac{-(c+1)}{f} \rightarrow \text{خط } d_1, d_2, \text{ موازی } \leftarrow m = 2 \leftarrow d_2 \text{ موازی } \leftarrow M \text{ نسبت } d_1 \text{ موازی}$$

$$y - y_A = -1(x - x_A) \Rightarrow y - 1 = -x + 1 \text{ هر دو } y = -x + 2$$

$$AA' \text{ و } d \text{ موازی } M \rightarrow x + a = -x + 2 \Rightarrow x = -1, y = 2$$

$$AA' \text{ موازی } M \rightarrow x_m = \frac{a+1}{f} = -1 \Rightarrow a = -2 \text{ و } y_m = \frac{b+1}{f} = 2 \Rightarrow b = 3$$

$$\Rightarrow 2b - a = 1 \times 2 + 2 = 4$$