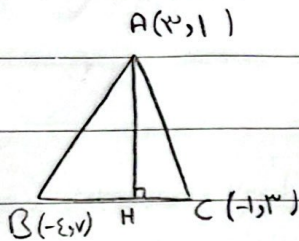


$$m = \frac{1 - (-9)}{2 - 2} = \frac{10}{0} = \infty$$

$$\Rightarrow y = -vx + 22$$

$$y = ax + b \xrightarrow{B(2, 1)} 1 = -v \times 2 + b \Rightarrow b = 22 \quad (1)$$



$$d_{BC} = \sqrt{(1-2)^2 + (-2+1)^2} = \sqrt{1+1} = \sqrt{2} \quad (2)$$

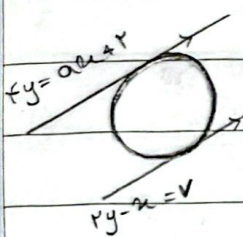
$$m_{BC} = \frac{1-3}{-2+1} = \frac{-2}{-1} = 2$$

$$BC \text{ line } \Rightarrow y = ax + b \xrightarrow{(-1, 3)} 3 = -2x - 1 + b \Rightarrow b = 6$$

$$\Rightarrow y = -2x + 6 \xrightarrow{\times 2} 2y + 4x - 6 = 0$$

$$BC \text{ line } A \text{ line } \Rightarrow \frac{|2 \times 3 + 4 \times 1 - 6|}{\sqrt{4+16}} = \frac{10}{\sqrt{20}} = \sqrt{5}$$

$$d_{BC} - d_{AH} = \sqrt{2} - \sqrt{5} = \sqrt{3}$$

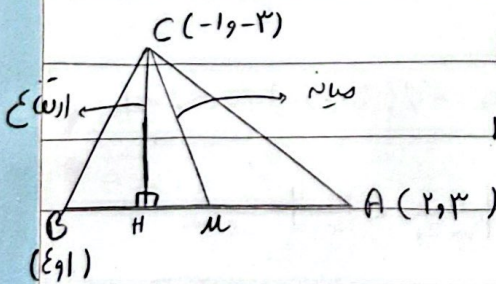


$$\text{Distance between lines} = \frac{1}{2} = \frac{a}{f} \Rightarrow a = 2 \quad (3)$$

$$\begin{cases} 2y - 2x = 2 \\ 2y - x = 1 \end{cases} \Rightarrow \begin{cases} 2y - 2x = 2 \\ 2y - x = 1 \end{cases}$$

$$\Rightarrow d = \frac{|1-1|}{\sqrt{1+1}} = \frac{0}{\sqrt{2}} = 0 \Rightarrow \text{Distance} = \frac{0}{\sqrt{2}} \Rightarrow \text{Distance} = \frac{1}{\sqrt{2}}$$

$$S_0 = \pi r^2 \Rightarrow \frac{9}{\omega} \pi = S_0$$



$$H \text{ is } CH, \text{ line } \Rightarrow \frac{|-1+2+3|}{\sqrt{1+1}} = \frac{2}{\sqrt{2}} \quad (4)$$

$$m_{AB} = \frac{3-2}{2-(-1)} = \frac{1}{3} \Rightarrow m_{CH} = 1 \Rightarrow y = mx + h \xrightarrow{(1, 1)}$$

$$\Rightarrow 1 = 1 + h \Rightarrow h = 0 \Rightarrow y = x \Rightarrow y - x = 0$$

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

(۵) برای معادله‌های زیر، مرکز و شعاع را بیابید

$$\frac{m+1}{2m-5} = \frac{a-m}{2m-7} \Rightarrow 2m^2 + 3m - 2m - 7 = 10m - 70 - 2m^2 + 5m$$

$$\Rightarrow 4m^2 - 14m + 11 = 0 \Rightarrow \Delta = 196 - 176 < 0 \Rightarrow m \text{ از این معادله مقدار نمی‌گیرد}$$

(۶) $2x - 1 = \frac{-x}{2} + \frac{y}{2} \Rightarrow \frac{4x}{2} + \frac{x}{2} = \frac{y}{2} + 1 \Rightarrow x = 1, y = 1 \Rightarrow A(1, 1)$

$-\frac{x}{2} + \frac{y}{2} = -x + 5 \Rightarrow x = 5, y = -1 \Rightarrow B(5, -1)$

$2x - 1 = 5 - x \Rightarrow 3x = 6 \Rightarrow x = 2, y = \frac{1}{2} \Rightarrow C(\frac{6}{2}, \frac{1}{2})$

CB را به $u = (5 + \frac{6}{2}, \frac{1}{2} - 1) \Rightarrow u(\frac{16}{2}, -\frac{1}{2})$ $m_{BC} = \frac{-\frac{1}{2}}{\frac{16}{2}} = -\frac{1}{16} \Rightarrow m_{AH} = 1$

$\Rightarrow y - 1 = 1(x - 1) \Rightarrow y = x$ $x = x + 5 \Rightarrow 2x = 5 \Rightarrow x = \frac{5}{2}, y = \frac{5}{2} \Rightarrow H(\frac{5}{2}, \frac{5}{2})$ $d_{AH} = \sqrt{1+1} = \sqrt{2}$

$d_{AM} = \sqrt{\frac{49}{9} + \frac{1}{9}} = \sqrt{\frac{50}{9}} = \frac{5\sqrt{2}}{3} \Rightarrow \frac{\frac{5\sqrt{2}}{3}}{\frac{5}{\sqrt{2}}} = \frac{2}{3}$

(۷) $m = -\frac{1}{2}$ $y = -\frac{1}{2}x + b \Rightarrow -\frac{1}{2}x - y + b = 0$ $d = \frac{|Ax_0 + By_0 + C|}{\sqrt{A^2 + B^2}}$

$\Rightarrow \frac{|C|}{\sqrt{\frac{1}{4} + 1}} = \sqrt{10} \Rightarrow |C| = \sqrt{10} \times \sqrt{\frac{5}{2}} \Rightarrow |C| = 5 \Rightarrow |b| = 5$

$a = -\frac{1}{2}x + b \Rightarrow x = 2b \Rightarrow A(2b, 0) \in (y=0)$ خط را به x و y تقاطع

AB را به $\Rightarrow \sqrt{(2b-0)^2 + (0-b)^2} = \sqrt{4b^2 + b^2} = |b|\sqrt{5} \Rightarrow 5\sqrt{5}$ $B(0, b) \in y$ را به y

(۸) $y = (1-m)x + r$ $y = \frac{2}{m}x + r$ $y_1 = y_2 \Rightarrow (1-m)x + r = \frac{2}{m}x + r$

$\Rightarrow x = 0, y = r \Rightarrow A(0, r)$

از معادله‌ها $\begin{cases} (1-m)x + r = 0 \Rightarrow x_1 = \frac{r}{m-1} \\ \frac{2}{m}x + r = 0 \Rightarrow x_2 = -\frac{mr}{2} \end{cases}$

$\Rightarrow (x_1, 0)(x_2, 0)(0, r) \Rightarrow h_{\Delta} = r$

$s_{\Delta} = \frac{1}{2}|x_1 - x_2|$

$\Rightarrow S_{\Delta} = \frac{1}{2} \times r \times |x_1 - x_2| = |x_1 - x_2| \Rightarrow \left| \frac{r}{m-1} + \frac{mr}{2} \right| = \frac{a}{r} \Rightarrow$

$\left\{ \begin{array}{l} \frac{r}{m-1} + \frac{mr}{2} = \frac{a}{r} \Rightarrow m = \frac{a}{r} \\ \frac{r}{m-1} + \frac{mr}{2} = -\frac{a}{r} \Rightarrow m = \frac{-r-\sqrt{a}}{r} \\ m = \frac{r+\sqrt{a}}{r} \end{array} \right\} \Rightarrow 2 \times (-r+\sqrt{a})(-r-\sqrt{a}) = -r$

⑨ نقطه $B(0, -3)$ را از خط d سبزه به نقطه M قرمز کسر:

$$\left. \begin{aligned} x_M &= \frac{x_B + x_{B'}}{2} \Rightarrow 2 = \frac{0 + x_{B'}}{2} \Rightarrow x_{B'} = 4 \\ y_M &= \frac{y_B + y_{B'}}{2} \Rightarrow -2 = \frac{-3 + y_{B'}}{2} \Rightarrow y_{B'} = -1 \end{aligned} \right\} \Rightarrow d' = \frac{x}{2} - 3$$

⑩ AA' بر خط d عمود است پس از این سبزه و قرمز d داریم:

$A(1, 2)$ $m_{AA'} = -1 \Rightarrow y - (2) = -1(x - 1) \Rightarrow y = -x + 3$
 $\Rightarrow AA': y = -x + 3$

$d: y = x + 5$

$$\begin{cases} y - x = 5 \\ y + x = 3 \end{cases} \Rightarrow y = 1, x = -2 \Rightarrow B(-2, 1)$$

$A(1, 2) \xrightarrow{+2} B(-2, 1) \xrightarrow{+2} A'(x', y')$
 $A(1, 2) \xrightarrow{+4} B(-2, 1) \xrightarrow{+4} A'(x', y')$
 $\Rightarrow x' = -5, y' = 1 \Rightarrow A'(-5, 1)$

$$\Rightarrow 2b - a = 2 \times 1 - (-5) = 7$$