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$$A \begin{vmatrix} x \\ y \end{vmatrix} \quad C \begin{vmatrix} x \\ y \end{vmatrix} \quad B \begin{vmatrix} 2x-2 \\ xy+y+1 \end{vmatrix} \Rightarrow C \begin{vmatrix} 3 \\ 1 \end{vmatrix}$$

$$M_{AB} = V \Rightarrow m_{HC} = \frac{1}{V} \Rightarrow y = \frac{1}{V}x + b \xrightarrow{(1,1)} 1 = \frac{3}{V} + b$$

$$\Rightarrow b = \frac{V-3}{V} \rightarrow y = \frac{1}{V}x + \frac{V-3}{V} \checkmark$$

$$BC = \sqrt{(2+1)^2 + (V-3)^2} = \sqrt{9+16} = 5 \checkmark$$

$$BC: y = -\frac{1}{3}x + b \xrightarrow{(1,3)} 3 = -\frac{1}{3}(1) + b \rightarrow b = \frac{10}{3} \rightarrow y = -\frac{1}{3}x + \frac{10}{3}$$

$$AH: \frac{|1+3-\frac{10}{3}|}{\sqrt{1+\frac{16}{9}}} = \frac{\frac{10}{3}}{\frac{5}{3}} = 2 \checkmark$$

$\Delta = 2, 3$

دو دایره موازی $\Rightarrow d < r \Rightarrow ry = rx + r \rightarrow ry - x = 1, ry - x = V$

$$d = \frac{|c-c'|}{\sqrt{a^2+b^2}} \rightarrow d = \frac{|V-1|}{\sqrt{r^2+1}} = \frac{4}{\sqrt{5}} \Rightarrow r = \frac{3}{\sqrt{5}}$$

$$S = \pi r^2 \rightarrow S = \pi \times \left(\frac{3}{\sqrt{5}}\right)^2 = \frac{9}{5}\pi \checkmark = 0,4\pi$$

$$A \begin{vmatrix} x \\ y \end{vmatrix} \quad M \begin{vmatrix} x \\ y \end{vmatrix} \quad B \begin{vmatrix} 2x-2 \\ xy-2 \end{vmatrix} \Rightarrow M \begin{vmatrix} 3 \\ 2 \end{vmatrix} \quad BC: y = -x + 4 \quad m_{BC} = -1$$

$$\Rightarrow m_{CH} = 1 \quad y = x + b \xrightarrow{(1,2)} 2 = 1 + b \Rightarrow b = 1$$

$$y = x + 1 \quad x-2 = -x+4 \rightarrow 2x=6 \rightarrow x=3, d \text{ و } y=1, d$$

$$MH = \sqrt{(3-3, d)^2 + (3-1, d)^2} = \sqrt{2\left(\frac{1}{2}\right)^2} = \sqrt{\frac{1}{2}} \checkmark$$

$$\frac{m+1}{2m-2} = \frac{-(d-m)}{2m-2} \rightarrow (m+1)(2m-2) = -(2m-2)(d-m)$$

$$2m^2+m-2 = -2m^2+(2m-2)d \rightarrow 4m^2 \leq 2m+1 \quad \Delta < 0$$

هیچ متغیر m $\checkmark$

$$\frac{r-n}{r} \leq t-n \rightarrow r n \leq d \rightarrow n \leq \frac{d}{r} \quad \frac{r-n}{r} \leq r n-1 \rightarrow d n \leq d \rightarrow n \leq 1$$

$$\frac{r-n}{r} \leq t-n \rightarrow n \leq d \quad A \begin{vmatrix} 1 \\ 1 \end{vmatrix} \quad B \begin{vmatrix} d \\ -1 \end{vmatrix} \quad C \begin{vmatrix} d \\ \frac{d}{r} \end{vmatrix} \quad M \begin{vmatrix} \frac{1}{r} \\ \frac{r}{r} \end{vmatrix}$$

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

$$\frac{AM}{AH} = \frac{\frac{\sqrt{d_0}}{r}}{\frac{1}{\sqrt{2}}} = \frac{d}{r} \checkmark$$

$$AM = \sqrt{\left(\frac{1}{r}-1\right)^2 + \left(\frac{r}{r}-1\right)^2} = \sqrt{\left(\frac{1}{r}\right)^2 + \left(\frac{1}{r}\right)^2} = \sqrt{\frac{2}{r}} = \frac{\sqrt{d_0}}{r}$$

خطی با این شیب $y = -\frac{1}{r}x \rightarrow ry + x = 0$ $d \leq \sqrt{r_0} \rightarrow \frac{|c-c'|}{a^2+b^2} \leq \sqrt{r_0}$

$$\sqrt{r_0} = \frac{|c-c'|}{\sqrt{r+1}} \Rightarrow c \leq \pm 1 \quad ry + x = 0 \xrightarrow{n \leq 0} y \leq d$$

در هر دو حالت
یک جواب دارد

$$AB = \sqrt{(d-0)^2 + (1-0)^2} = \sqrt{d^2+1} \leq \sqrt{2d} \leq d\sqrt{2} \checkmark$$

$$(1-m)x + r \leq 0 \rightarrow x \leq \frac{r}{1-m} \quad rx + rm \leq 0 \rightarrow x \leq \frac{m}{r}$$

$$y \leq (1-m)x + r \quad y \leq \frac{rx+m}{m} + r \quad (1-m)x + r \leq \frac{rx+m}{m} + r \rightarrow x \leq 0 \Rightarrow y \leq r$$

$$\frac{1}{r} \times \left| \frac{r}{1-m} - \frac{m}{r} \right| \times r \leq \frac{d}{r} \rightarrow \left| \frac{r}{1-m} - \frac{m}{r} \right| \leq \frac{d}{r} \rightarrow \left| \frac{m^2-m+r}{r^2-m} \right| \leq \frac{d}{r} \checkmark$$

$$rm^2 - rm + 1 \leq dm \rightarrow rm^2 + 3m - 2 \leq 0 \quad S = -\frac{3}{r} \quad m^2 - 4m + 9 = 0 \rightarrow m = 3$$

$$rm^2 - rm + 1 \leq dm - 1 \rightarrow rm^2 - 7m + 1 \leq 0 \quad \Delta < 0 \quad m^2 + 7m - 1 = 0 \quad \frac{\Delta}{a} = -1$$

نقطه (۲، ۱) و (۲، ۳) $1 \leq 2(2) - 3$ $A \begin{vmatrix} 2 \\ 1 \end{vmatrix} \quad B \begin{vmatrix} 2 \\ -2 \end{vmatrix} \quad C \begin{vmatrix} 4-2 \\ -4-1 \end{vmatrix} = \begin{vmatrix} 2 \\ -5 \end{vmatrix}$ $\checkmark$

$m \leq 2$ $\left. \begin{array}{l} \text{نقطه (۲، ۱)} \\ \text{نقطه (۲، ۳)} \end{array} \right\} y = 2x - 3$ $\checkmark$

$$m' \leq \frac{1}{m} \Rightarrow m' \leq -1 \quad y = -x + b \xrightarrow{A(1,2)} 2 = -1 + b \Rightarrow b \leq 3$$

$$y = -x + 3 \quad -x + 3 \leq x + d \rightarrow 2x \leq 2 \rightarrow x \leq 1, y \leq 4$$

$$A \begin{vmatrix} 1 \\ 2 \end{vmatrix} \quad B \begin{vmatrix} -1 \\ 2 \end{vmatrix} \quad C \begin{vmatrix} -2-1 \\ 1-2 \end{vmatrix} = \begin{vmatrix} -3 \\ -1 \end{vmatrix} \Rightarrow a \leq -3 \quad 2b - a \leq 2 + 3 \leq 5 \quad \checkmark$$