

$MAB = \frac{-2-1}{4-2} = \frac{-14}{2} = -7$ شیب عدد منفی $\rightarrow \left(\frac{1}{7}\right)$ نقطه وسط خط $\Rightarrow x = \frac{2+4}{2} = 3$ $y = \frac{1-2}{2} = -\frac{1}{2} \rightarrow (3, -\frac{1}{2})$ AB معادله $\Rightarrow y - 1 = \frac{1}{7}(x - 3) \Rightarrow y = \frac{1}{7}x - \frac{3}{7} + 1 \Rightarrow y = \frac{1}{7}x + \frac{4}{7}$ $\boxed{7y = x + 4}$	۱
BC معادله $\Rightarrow y = -\frac{4}{5}x + \frac{5}{5}$ طول $BC = \sqrt{(-4-1)^2 + (5-2)^2} = \boxed{5}$ AC معادله $\Rightarrow y = \frac{5}{4}x - \frac{5}{4}$ طول $AC = \sqrt{(\frac{5}{4}-2)^2 + (-\frac{5}{4}-1)^2} = \sqrt{\frac{25}{16} + \frac{81}{16}} = \sqrt{\frac{106}{16}} = \frac{\sqrt{106}}{4}$ AB, BC معادله $\Rightarrow -\frac{4}{5}x + \frac{5}{5} = \frac{5}{4}x - \frac{5}{4} \Rightarrow 20x = 20 \Rightarrow x = 1$ $H = (\frac{1}{5}, -\frac{1}{5})$ $\Rightarrow \begin{cases} x = \frac{1}{5} \\ y = -\frac{1}{5} \end{cases}$ $\sqrt{\frac{100}{25}} = \boxed{2}$ اضلاع BC, AC $\Rightarrow 5 - 2 = \boxed{3}$	۲
$7y - x - 4 = 0 \rightarrow 4y - 2x - 14 = 0$ $4y - 5x - 5 = 0 \rightarrow 4y - 2x - 2 = 0$ $\frac{14}{x\sqrt{5}} \Rightarrow \frac{2\sqrt{5}}{5} = 0$ قطر دایره $\Rightarrow$ شعاع دایره $\frac{2\sqrt{5}}{10} = \boxed{\frac{\sqrt{5}}{5}}$ مساحت دایره $= \pi r^2 \Rightarrow \pi \frac{4}{5} = \boxed{\frac{4}{5} \pi}$ $\pi = 3 \rightarrow \boxed{\frac{12}{5}}$	۳
نقطه $M = (\frac{2+4}{2}, \frac{1+2}{2}) = (3, \frac{3}{2})$ AB معادله $\Rightarrow$ شیب $= -1 \Rightarrow y = -x + 4$ AC معادله $\Rightarrow$ شیب $= 1 \Rightarrow y = x - 2$ CH, AB معادله $\Rightarrow x - 2 = -x + 4 \Rightarrow x = 3$ $H = (\frac{3}{2}, \frac{3}{2})$ $\Rightarrow \begin{cases} x = \frac{3}{2} \\ y = \frac{3}{2} \end{cases}$ طول $CH = \sqrt{(\frac{3}{2}-3)^2 + (\frac{3}{2}-\frac{3}{2})^2} = \sqrt{\frac{9}{4}} = \frac{3}{2}$ طول $AC = \sqrt{(\frac{3}{2}-2)^2 + (\frac{3}{2}-1)^2} = \sqrt{\frac{1}{4} + \frac{1}{4}} = \sqrt{\frac{2}{4}} = \frac{\sqrt{2}}{2}$	۴
$(m+1)x - (2m-4)y + 1 = 0$ شیب $\rightarrow \left(\frac{m+1}{2m-4}\right)$ $(3m-2)x + (5-m)y - 7 = 0$ شیب $\rightarrow \frac{-(3m-2)}{5-m}$ برای اینکه دایره با شعاع دایره مماس باشد برابر با ۱ باشد $\Rightarrow \left(\frac{m+1}{2m-4}\right) \times \frac{-(3m-2)}{5-m} = -1 \Rightarrow 3m^2 + m - 2 = -2m^2 + 14m - 5$ $5m^2 - 13m + 7 = 0$	۵

$$y = \frac{-x+1}{\sqrt{2}} \Rightarrow AB \quad M_{b \rightarrow a} \Rightarrow \left(\frac{x_0}{\sqrt{2}}, -\frac{1}{\sqrt{2}} \right) \xrightarrow{(AM)} \boxed{y = \frac{\sqrt{2}}{10}x - \frac{1}{\sqrt{2}}}$$

$$y = 2x - 1 \Rightarrow AC \quad N_{b \rightarrow a} \Rightarrow \frac{1}{10} \quad AH \Rightarrow \boxed{-10}$$

$$y = -x + 1 \Rightarrow BC \quad N_{b \rightarrow a} \Rightarrow \boxed{y = -10x + 19}$$

$A \left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}} \right)$
 $B \left(\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}} \right)$
 $C \left(\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}} \right)$
 $\frac{AM}{AH} \Rightarrow \frac{\frac{\sqrt{2}}{10}x - \frac{1}{\sqrt{2}}}{-10x + 19}$

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$$y = -\frac{1}{2}x + c \Rightarrow y + \frac{1}{2}x - c = 0 \quad (0,0) \text{ لا تقع } \frac{|-c|}{\sqrt{1 + \frac{1}{4}}} = \sqrt{2}$$

$$| -c | = \sqrt{2} \Rightarrow \sqrt{2} \times \frac{\sqrt{2}}{2} \Rightarrow | -c | = 1 \Rightarrow c = \pm 1$$

$$c = 1 \Rightarrow y = -\frac{1}{2}x + 1 \quad \text{بـ } A \text{ بـ } C \Rightarrow y = (0, 1), x = (1, 0)$$

$$c = -1 \Rightarrow y = -\frac{1}{2}x - 1 \quad \text{بـ } A \text{ بـ } C \Rightarrow y = (0, -1), x = (-1, 0)$$

$$A_{\text{مربع}} < \frac{\sqrt{(-1-0)^2 + (1-0)^2}}{\sqrt{(1-0)^2 + (0-1)^2}} \Rightarrow \sqrt{2} < \sqrt{2} \Rightarrow \sqrt{2} < \sqrt{2} \Rightarrow \sqrt{2} < \sqrt{2}$$

$$x' = x - r \Rightarrow x = x' + r$$

$$y' = y + r \Rightarrow y = y' - r$$

$$y' - r = r(x' + r) - r \Rightarrow y' = rx' + r^2 + r$$

$$\boxed{y' = rx' + r^2}$$

$$y = x + d \Rightarrow x - y + d = 0 \quad (a=1) \quad (b=-1) \quad (c=d)$$

$$\text{المسافة} \Rightarrow d = \frac{ax_0 + by_0 + c}{a^2 + b^2} \Rightarrow x = x_0 - rad, y = y_0 - rbd$$

$$d = \frac{1 \times 1 + (-1)(1) + d}{1 + 1} \Rightarrow \frac{1 - 1 + d}{2} \Rightarrow \frac{d}{2} = r$$

$$x = 1 - r \times 1 \times r = 1 - r = -r$$

$$y = 1 - r \times (-1) \times r = 1 + r = r$$

$$\left. \begin{array}{l} x = -r \\ y = r \end{array} \right\} (-r, r) \rightarrow rb - a = 1r + r = 1d$$