

$$m = \frac{-4-1}{4-2} = -\frac{5}{2} \quad \text{و} \quad \left(\frac{2+4}{2}, \frac{-4+1}{2} \right) = (3, 1) \quad \text{①}$$

$\text{عمود منصف} = \frac{1}{\frac{5}{2}} = \frac{2}{5}$

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$$\text{①②} \rightarrow y-1 = -\frac{5}{2}(x-3) \rightarrow y = -\frac{5}{2}x + \frac{15}{2} + 1$$

$$y-1 = \frac{2}{5}(x-3) \rightarrow y = \frac{2}{5}x - \frac{6}{5} + 1$$

$$BC \rightarrow \sqrt{(7-3)^2 + (-4+1)^2} = 5 \quad \text{①} \quad m_{BC} = \frac{7-3}{-4+1} = -\frac{4}{3}$$

$$\Rightarrow BC \Rightarrow y-3 = -\frac{4}{3}(x+1) \Rightarrow y = -\frac{4}{3}x + \frac{5}{3} \Rightarrow 3y + 4x - 5 = 0$$

$$AH \rightarrow \frac{3(1)+4(3)-5}{\sqrt{9+16}} = \frac{10}{5} = 2 \quad \text{②} \quad \checkmark$$

$$\text{①②} \rightarrow BC-AH = 5-2 = 3 \quad \checkmark$$

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$$\Rightarrow \frac{r}{p} = \frac{a}{-(-1)} \Rightarrow a=2, \quad r = \frac{|c-c'|}{\sqrt{20}} \Rightarrow r = \frac{|14-2|}{\sqrt{20}}$$

$$\Rightarrow r = \frac{4}{\sqrt{20}} = \frac{2}{\sqrt{5}}$$

$$S = \pi r^2 = \pi \left(\frac{2}{\sqrt{5}} \right)^2 = \frac{4}{5} \pi \quad \checkmark$$

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$$m_{AB} = \frac{3-1}{2-4} = -1 \Rightarrow y-3 = -(x-2) \Rightarrow y+x=5$$

$$m_{CH} = -\frac{1}{-1} = 1 \Rightarrow y+3 = (x+1) \Rightarrow y-x = -2$$

$$\Rightarrow y = \frac{3}{2}, x = \frac{7}{2} \quad \text{①} \quad m = \left(\frac{4+2}{2}, \frac{3+1}{2} \right) = (3, 2) \quad \text{②}$$

$$\text{①②} \rightarrow \sqrt{\left(3-\frac{7}{2}\right)^2 + \left(2-\frac{3}{2}\right)^2} = \sqrt{\frac{1}{4} + \frac{1}{4}} = \frac{\sqrt{2}}{2} \quad \checkmark$$

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$$m \times m' = -1 \Rightarrow \left(-\frac{3m-2}{5-m} \right) \left(-\frac{m+1}{-(2m+4)} \right) = -1$$

$$(3m-2)(m+1) - (5-m)(2m+4) = 0$$

$$\Rightarrow 5m^2 - 13m + 18 = 0 \rightarrow \Delta < 0$$

هیچ مقدار حقیقی برای m وجود ندارد. $\checkmark$

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$A \rightarrow x + 2(2x - 1) = 3 \Rightarrow \Delta x = \Delta \Rightarrow x = 1, y = 1$ $B \rightarrow x + 2(1 - x) = 3 \Rightarrow -x = -\Delta \Rightarrow x = \Delta, y = -1$ $C \rightarrow x + 2x - 1 = 4 \Rightarrow 3x = \Delta \Rightarrow x = \frac{\Delta}{3}, y = \frac{1}{3}$ $AM \rightarrow \sqrt{(\frac{\Delta}{3} - 1)^2 + (\frac{1}{3} - 1)^2} = \sqrt{\frac{\Delta^2}{9}} = \frac{\Delta\sqrt{2}}{3} \quad ①$ $BC \rightarrow m_{BC} = \frac{\frac{1}{3} - (-1)}{\frac{\Delta}{3} - 1} = -1 \Rightarrow y + 1 = -(x - \Delta) \Rightarrow y + x - \Delta = 0$ $AH \rightarrow \frac{1(1) + (1) - 4}{\sqrt{1+1}} = \frac{2}{\sqrt{2}} = \sqrt{2} \quad ② \quad \frac{\Delta\sqrt{2}}{\sqrt{2}} = \frac{\Delta}{\sqrt{2}} \quad \checkmark$	۶ ۲
$m = -\frac{1}{\sqrt{2}} \Rightarrow y = -\frac{1}{\sqrt{2}}x + b \Rightarrow A = (0, b), B = (2b, 0)$ $AB \Rightarrow AB = \sqrt{(2b-0)^2 + (0-b)^2} = \sqrt{5b^2} = b \sqrt{5} \quad ①$ $x + 2y - 2b = 0 \xrightarrow{(0,0)} \frac{ 0+0-2b }{\sqrt{1+4}} = \frac{2 b }{\sqrt{5}} = 2\sqrt{5} \Rightarrow b = \Delta \quad ②$ $\textcircled{1} \textcircled{2} \Rightarrow \Delta\sqrt{5} \quad \checkmark$	۷ ۲
$\text{خط اول} \rightarrow y = \frac{k}{m}x + 2 \quad \text{خط دوم} \rightarrow y = (1-m)x + 2$ $\text{تقاطع} \Rightarrow \frac{k}{m}x + 2 = (1-m)x + 2 \Rightarrow \frac{k}{m}x = (1-m)x \Rightarrow x = 0, y = 2 \quad ①$ $\text{تقاطع با محور x} \rightarrow 0 = \frac{k}{m}x + 2 \Rightarrow x_1 = -\frac{2m}{k} \quad ② \quad 0 = (1-m)x + 2 \Rightarrow x_2 = \frac{-2}{1-m} \quad ③$ $\textcircled{1} \textcircled{2} \textcircled{3} \Rightarrow S = \frac{1}{2} x_1 - x_2 \times 2 = \frac{\Delta}{2} \Rightarrow -\frac{2m}{k} + \frac{2}{1-m} = \frac{\Delta}{2}$ $\text{تقسیم} \rightarrow 2(1-m)(-\frac{2m}{k} + \frac{2}{1-m}) = 2(1-m) \times \frac{\Delta}{2} \Rightarrow m^2 + km - 1 = 0 \Rightarrow m = -2 \pm \sqrt{5}$ $\text{آزمون} \rightarrow m^2 - m + 4 = -\Delta + \Delta m \Rightarrow (m-3)^2 = 0 \Rightarrow m = 3 \Rightarrow (-2+\sqrt{5})(-2-\sqrt{5})^3 = -3 \quad \checkmark$	۸ ۲
$x = 0 \rightarrow y = -3, x = 1 \rightarrow y = -1$ $\text{قرینه ۳} \rightarrow (2 \times 2 - 0, 2 \times (-1) + 3) = (4, -1)$ $\text{قرینه ۱} \rightarrow (2 \times 2 - 1, 2 \times (-2) + 1) = (3, -3)$ $\left. \begin{aligned} & \text{این دو خط موازی هستند و} \\ & \text{شیب برابر دارند نیازی به محاسبه نبود} \end{aligned} \right\} m = \frac{-3 - (-1)}{3 - 4} = 2$ $\Rightarrow y + 3 = 2(x - 3) \Rightarrow y = 2x - 9$ وقت!	۹ ۱, ۷, ۵
$y = x + \Delta \rightarrow m = 1 \Rightarrow m' = -1 \Rightarrow y - 2 = -(x - 1) \Rightarrow y = -x + 3$ $\text{تقاطع} \rightarrow -x + 3 = x + \Delta \Rightarrow 2x = -2 \Rightarrow x = -1, y = 4$ $\text{قرینه} \rightarrow (2 \times (-1) - 1, 2 \times 4 - 2) = (-3, 6) \quad \checkmark$ $\Rightarrow 2b - a = 2 \times 4 + 3 = 11 \quad \checkmark$	۱۰ ۲