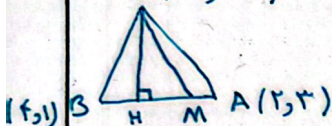


$$A(4, -2) \rightarrow m = \frac{1 - (-2)}{2 - 4} = \frac{1}{-2} = \left(-\frac{1}{2}\right) \xrightarrow{\text{مردمشت}} \left(+\frac{1}{2}\right)$$

$$B(2, 1)$$

$$\text{انتهای منحنی} \rightarrow \left(\frac{4+2}{2}, \frac{-2+1}{2}\right) \rightarrow (3, 0) \rightarrow y - 0 = \frac{1}{2}(x - 3) \rightarrow y = \frac{1}{2}x + \frac{3}{2}$$

$$C(-1, -3)$$



$$M = \left(\frac{4+2}{2}, \frac{1+3}{2}\right) \rightarrow (3, 2)$$

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

$$y = -x + 5$$

$$\Rightarrow \begin{cases} y = -x + 5 \\ y = x - 2 \end{cases} \rightarrow x - 2 = -x + 5 \rightarrow 2x = 7 \rightarrow x = \frac{7}{2} = 3.5$$

$$y = \frac{7}{2} - 2 = \frac{3}{2} = 1.5$$

$$MH = \sqrt{(3.5-2)^2 + (1.5-2)^2} = \sqrt{0.5^2 + (-0.5)^2} = \sqrt{0.5} = \frac{1}{\sqrt{2}}$$

$$2y - x = 5 \rightarrow y = \frac{1}{2}x + \frac{5}{2}$$

$$4y = 2x + 5 \rightarrow y = \frac{1}{2}x + \frac{5}{4}$$

$$d = \left| \frac{5}{4} - \frac{5}{2} \right| = \frac{5}{4} = \frac{5}{\sqrt{1 + \left(\frac{1}{2}\right)^2}} = \frac{5}{\sqrt{1 + \frac{1}{4}}} = \frac{5}{\sqrt{\frac{5}{4}}} = \frac{5}{\frac{\sqrt{5}}{2}} = \frac{10}{\sqrt{5}} = 2\sqrt{5}$$

$$\text{مساحت} = \pi r^2 = \pi \left(\frac{10}{\sqrt{5}}\right)^2 = \pi \cdot \frac{100}{5} = 20\pi$$

$$BC = \sqrt{(-1+4)^2 + (3-1)^2} = \sqrt{9+4} = \sqrt{13}$$

$$\text{مساحت} = \frac{1}{2} (4(3-1) + (-1)(3-1) + (-1)(1-3)) = \frac{1}{2} (4(2) - 1(2) - 1(-2)) = \frac{1}{2} (8 - 2 + 2) = \frac{1}{2} (8) = 4$$

$$\rightarrow AH = \frac{2 \times 4}{\sqrt{13}} = \frac{8}{\sqrt{13}}$$

$$\rightarrow BC - AH = \sqrt{13} - \frac{8}{\sqrt{13}}$$

$$\text{②} \rightarrow m_{BC} = \frac{3-1}{-1-4} = \frac{2}{-5} = -\frac{2}{5} \rightarrow y - 1 = -\frac{2}{5}(x + 1) \rightarrow y = -\frac{2}{5}x + \frac{3}{5}$$

$$\Rightarrow \frac{3}{5} - \frac{3}{5} = -\frac{2}{5} \Rightarrow \frac{3}{5} - \frac{3}{5} = -\frac{2}{5} \Rightarrow \frac{3}{5} - \frac{3}{5} = -\frac{2}{5}$$

$$(4m+5)x + (d-m)y - 5 = 0 \rightarrow y = -\frac{4m+5}{d-m}x + \frac{5}{d-m} \rightarrow m_1 = -\frac{4m+5}{d-m}$$

$$(m+1)x - (2m-4)y + 1 = 0 \rightarrow y = -\frac{m+1}{2m-4}x - \frac{1}{2m-4} \rightarrow m_2 = -\frac{m+1}{2m-4}$$

$$m_1 \cdot m_2 = -1 \rightarrow \left(-\frac{4m+5}{d-m}\right) \left(-\frac{m+1}{2m-4}\right) = -1$$

$$\frac{(4m+5)(m+1)}{(d-m)(2m-4)} = -1 \rightarrow (4m+5)(m+1) = -(d-m)(2m-4)$$

$$4m^2 + 9m + 5 = -2m^2 + 4m + 2d - 4m \rightarrow 6m^2 + 9m + 5 = 2d - 4m \rightarrow 6m^2 + 13m + 5 = 2d$$

