

$$\begin{cases} x_1 = \frac{1+5}{2} = 3 \\ y_1 = \frac{1-4}{2} = -1 \end{cases} \Rightarrow m = \frac{1}{1}$$

عبور از نقطه $(3, 1)$ و $y = \frac{1}{v}x + h$

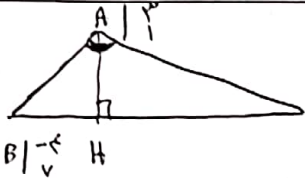
$$m = \frac{\Delta y}{\Delta x} = \frac{1 - (-2)}{-4 - 2} = -\frac{1}{2}$$

$$1 = \frac{1 \cdot 3}{v} + h \Rightarrow h = \frac{4}{v}$$

عدد مضروب $m = +\frac{1}{v} \Rightarrow y = \frac{1}{v}x + h$
مربع و یکدست

$$\boxed{y = \frac{1}{v}x + \frac{4}{v}}$$

$$vy = x + 4$$



$$3y = -4x + d$$

فاصله A از BC

$$\frac{|am + by + c|}{\sqrt{a^2 + b^2}}$$

$$m = \frac{1 - (-2)}{-4 - (-1)} = \frac{1}{-3} = -\frac{1}{3} \Rightarrow AH = 2$$

$$BC - AH = d - 3 = 2$$

$$\sqrt{4m^2 + d^2} = \sqrt{4(-\frac{1}{3})^2 + (-2)^2} = d = BC$$

$$BC \text{ خط } m \Rightarrow \frac{\Delta y}{\Delta x} = -\frac{4}{3} \Rightarrow y - 1 = -\frac{4}{3}(x - 3) \Rightarrow y = -\frac{4}{3}x + 5$$

$$\begin{cases} y = am + 2 \\ y - x = 1 \end{cases} \Rightarrow \frac{a}{1} = \frac{1}{-1} \Rightarrow a = -1$$

$$y - 2x - 2 = 0$$

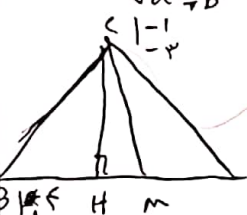
$$y - 2x - 1 = 0$$

فاصله دو خط

$$\frac{|c' - c|}{\sqrt{a^2 + b^2}}$$

$$\frac{|1 - (-2)|}{\sqrt{1 + 4}} = \frac{3}{\sqrt{5}} = \frac{4}{\sqrt{5}} \Rightarrow r = \frac{3}{\sqrt{5}}$$

$$S = \pi r^2 = \pi \left(\frac{3}{\sqrt{5}}\right)^2 = \frac{9\pi}{5}$$



$$m = -1 \Rightarrow x_1 = \frac{1+5}{2} = 3, y_1 = \frac{1-4}{2} = -1$$

$$y_1 = \frac{1-4}{2} = -1$$

$$AB \text{ خط } m = \frac{1}{-2} = -\frac{1}{2} \Rightarrow 1 = 4(-1) + h \Rightarrow h = 5$$

$$CH \text{ خط } m = 1 \Rightarrow -3 = -1(1) + h \Rightarrow h = -2 \Rightarrow y = x - 2$$

$$x - 2 = -x + 5 \Rightarrow x = \frac{7}{2}, y = \frac{3}{2}$$

$$m_1 = \frac{-3m + 2}{d - m}$$

$$m_2 = \frac{m + 1}{2m - 4}$$

تشریح و یکدست $\rightarrow$ عدد

$$\frac{-3m + 2}{d - m} = \frac{2m - 4}{-m - 1} \Rightarrow 4m^2 - 2m + 3m - 2 = -2m^2 + 4m - 2$$

$$6m^2 - 12m + 12 = 0$$

$$b^2 - 4ac = 144 - 420 < 0$$

مقداری از m (این) پس معادله جواب ندارد از این هیچ دو خط عمود نمی شوند

$ \begin{aligned} AB \Rightarrow m + y = r &\Rightarrow y = \frac{-m+r}{1} \Rightarrow \frac{-m+r}{1} = r(m-1) \Rightarrow m = 1 \Rightarrow y = 1 \quad A \mid \mid \\ AC \Rightarrow y = r(m-1) &\Rightarrow y = r(m-1) \\ BC \Rightarrow m + y = r &\Rightarrow y = -m + r \Rightarrow -m + r = r(m-1) \Rightarrow m = \frac{r}{1-r} \Rightarrow y = \frac{r}{1-r} \quad C \mid \mid \\ AB, BC \Rightarrow \frac{-m+r}{1} = -m + r &\Rightarrow m = 1 \Rightarrow y = -1 \quad B \mid \mid \\ M = \begin{cases} m = \frac{d + \frac{a}{r}}{r} \\ y = -1 + \frac{r}{1-r} \end{cases} \Rightarrow M = \begin{pmatrix} \frac{1}{r} \\ \frac{r}{1-r} \end{pmatrix} & \text{By Axiom } \Rightarrow \frac{ 1 \ 0 \ -1 }{\sqrt{1+0+1}} = \sqrt{2} \quad \frac{AM}{AH} = \frac{\frac{d\sqrt{r}}{r}}{\sqrt{2}} = \boxed{\frac{d}{r}} \\ & AM = \sqrt{\left(1 - \frac{1}{r}\right)^2 + \left(\frac{r}{1-r}\right)^2} = \frac{d\sqrt{r}}{r} \end{aligned} $	8
$ \begin{aligned} y = -\frac{1}{r}m + k & \quad y = -\frac{1}{r}m + d \\ \sqrt{r} = \frac{C \cdot k}{\sqrt{\left(\frac{1}{r}\right)^2 + 1}} = C \cdot d & \quad 0 = -\frac{1}{r}(m) + d \Rightarrow m = 10 \Rightarrow y = 0 \quad \cdot \\ y = 0(m) + d \Rightarrow k = 0 \Rightarrow y = d & \quad y = 0(m) + d \Rightarrow k = 0 \Rightarrow y = d \quad \cdot \\ AB = \sqrt{am^2 + ay^2} = \sqrt{1 + r^2} = \boxed{d\sqrt{a}} \end{aligned} $	9
$ \begin{aligned} y + mx = r &\Rightarrow x = \frac{r-y}{m-1} \quad \left \frac{r}{m-1} + \frac{m}{r} \right = \frac{a}{r} \\ my - rx = r &\Rightarrow x = -\frac{1}{r}m \\ \textcircled{1} \quad m - \frac{r}{1-m} = d &\Rightarrow m = \frac{r}{1-r} \Rightarrow m = \frac{r}{1-r} \\ \textcircled{2} \quad m - \frac{r}{1-m} = -d &\Rightarrow m = \frac{r}{1-r} \Rightarrow m = \frac{r}{1-r} \\ &\quad m = -r \pm \sqrt{a} \quad (-r + \sqrt{a})(-r - \sqrt{a}) = (r-a)(r) = \boxed{-r^2} \end{aligned} $	10
$ \begin{aligned} y = rm - r &\Rightarrow M \mid \mid \\ \hookrightarrow x = r, y = r & \Rightarrow r = \frac{r + m}{r} \Rightarrow m = 1 \quad \cdot \\ -r = \frac{r + y}{r} &\Rightarrow y = -r \\ y = rm - r & \Rightarrow y = -r \\ y = rm - r & \Rightarrow y = -r \\ y = (-r) = r(m-1) & \Rightarrow y = -r \\ \boxed{y = rm - r} \end{aligned} $	11
$ \begin{aligned} A \mid \mid y = x + a & \\ y - r = -(x-1) &\Rightarrow y = -x + r \\ -m + r = x + a &\Rightarrow x = -1 \\ \frac{1+a}{r} = -1 &\Rightarrow x = -r \\ \frac{r+y}{r} = r &\Rightarrow y = r \\ \frac{1+a}{r} = -1 &\Rightarrow x = -r \\ \frac{r+y}{r} = r &\Rightarrow y = r \\ \Rightarrow A' \mid \mid a, b & \\ \Rightarrow a = -r & \\ \Rightarrow b = r & \\ \Rightarrow b - a = r - (-r) = \boxed{2r} \end{aligned} $	12