

AC(۴, -۴)
BC(۲, ۱)

$$m' = \frac{1}{V} \rightarrow y = \frac{1}{V}x + b \xrightarrow{(۲, ۱)} 1 = \frac{2}{V} + b$$

$$b = \frac{F}{V} \rightarrow y = \frac{1}{V}x + \frac{F}{V}$$

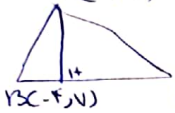
$$M\left(\frac{F+2}{2}, \frac{-4+1}{2}\right) \rightarrow M\left(\frac{F}{2}, -\frac{3}{2}\right)$$

$$m_{AB} = \frac{\Delta y}{\Delta x} = \frac{1 - (-4)}{2 - 4} = -\frac{5}{2} \rightarrow m' = \frac{2}{5}$$

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AC(۴, ۱)



طول وتر $\sqrt{\Delta y^2 + \Delta x^2} = \sqrt{1^2 + (-1)^2} = \sqrt{2}$

$m_{BC} = \frac{V-1}{-F+1} = \frac{K}{-F} \rightarrow y = \frac{K}{-F}x + b \xrightarrow{(-1, 1)} 1 = \frac{K}{-F} + b$

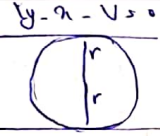
$$\Rightarrow y = \frac{F}{K}x + \frac{K-F}{K} \xrightarrow{y=0} x = \frac{F-K}{F} \rightarrow x = \frac{F}{F} = 1$$

$AB \text{ خط } = \frac{|ax+by+c|}{\sqrt{a^2+b^2}} = \frac{|(1 \times 4) + (-1 \times 1) + (-1)|}{\sqrt{1^2+1^2}} = \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$

BC خط - AB خط = $\sqrt{2} - \frac{1}{\sqrt{2}} = \frac{2-1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$

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$y - x - V = 0$
 $x^2 + y^2 - 2rx - 2ry + r^2 + r^2 = 0$
 $x^2 + y^2 - 2rx - 2ry + 2r^2 = 0$

$xy - ax - 2y = 0 \rightarrow xy - 2x - 2y = 0$

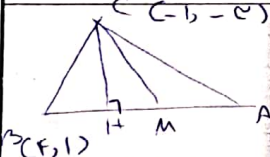
$r = \frac{|c-c'|}{\sqrt{a^2+b^2}} = \frac{|-1-(-2)|}{\sqrt{1^2+1^2}} = \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} \rightarrow r = \frac{1}{\sqrt{2}}$

$COL = \pi r^2 = \pi \left(\frac{1}{\sqrt{2}}\right)^2 = \frac{\pi}{2}$

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C(-۱, -۱)



$m_{AB} = \frac{1-0}{1-1} = \frac{1}{0} = \infty$
 $m_{BC} = \frac{-1-0}{-1-1} = \frac{-1}{-2} = \frac{1}{2}$
 $y = \frac{1}{2}x + b \xrightarrow{(1, 0)} 0 = \frac{1}{2} + b \rightarrow b = -\frac{1}{2}$
 $y = \frac{1}{2}x - \frac{1}{2}$

$CH \text{ خط } = \frac{|ax+by+c|}{\sqrt{a^2+b^2}} = \frac{|(-1)(1) + (-1)(1) + (-1)|}{\sqrt{1+1}} = \frac{3}{\sqrt{2}}$

$M\left(\frac{F+1}{2}, \frac{1+(-1)}{2}\right) \rightarrow M\left(\frac{F}{2}, 0\right)$

$CM \text{ خط } = \sqrt{\Delta x^2 + \Delta y^2} = \sqrt{(1-(-1))^2 + (1-(-1))^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$

$CH^2 + MH^2 = CM^2 \rightarrow \left(\frac{3}{\sqrt{2}}\right)^2 + MH^2 = (2\sqrt{2})^2$
 $\frac{9}{2} + MH^2 = 8 \rightarrow MH^2 = 8 - \frac{9}{2} = \frac{7}{2} \rightarrow MH = \sqrt{\frac{7}{2}}$

$(a-m)y = (m-m')x + V$

$(1-m)y = (m-1)x + V \rightarrow m = \frac{1-V}{1-m}$
 $(m+1)x - (1-m)y + 1 = 0 \rightarrow m' = \frac{m+1}{1-m}$

$\rightarrow \left(\frac{1-m}{1-m}\right) \times \left(\frac{m+1}{1-m}\right) = 1 \rightarrow \frac{1-m}{1-m} = \frac{1-m}{1+m} \rightarrow 1-m = 1-m \rightarrow 1-m = 1-m$

$\rightarrow 1-m = 1-m \rightarrow 0 = 0$

به این ترتیب داریم

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$\begin{cases} AB: x+y=0 \rightarrow y=-x \\ AC: y=2x-1 \\ BC: x+y=1 \end{cases}$

$A(0,1)$

$\Delta y^2 + \Delta x^2 = \sqrt{(-1)^2 + (2)^2} = \sqrt{5}$

$\Delta y = \frac{2}{\sqrt{5}}, \Delta x = \frac{-1}{\sqrt{5}}$

$M(\frac{1}{\sqrt{5}}, \frac{1}{\sqrt{5}})$

$\frac{AM}{Alt} = \frac{\frac{\sqrt{5}}{2}}{\frac{\sqrt{5}}{2}} = 1$

$m = \frac{1}{2} \rightarrow y = \frac{1}{2}x + b$

$A(0,1) \rightarrow 1 = \frac{1}{2} \cdot 0 + b \rightarrow b = 1$

$BC: x+y=1$

$\frac{1}{\sqrt{5}} = \frac{|(0)(1) + (1)(\frac{1}{2}) - b|}{\sqrt{1 + \frac{1}{4}}} = \frac{|b - \frac{1}{2}|}{\sqrt{\frac{5}{4}}} \rightarrow |b - \frac{1}{2}| = \frac{\sqrt{5}}{2}$

$b = \frac{1}{2} + \frac{\sqrt{5}}{2} \text{ or } b = \frac{1}{2} - \frac{\sqrt{5}}{2}$

$\textcircled{1} my - x = 2m \rightarrow y = \frac{x+2m}{m}$

$\textcircled{2} y + mx = x + 1 \rightarrow y = (1-m)x + 1$

$\textcircled{3} x = 0 \rightarrow y = 1$

$\textcircled{4} \frac{x}{m} + 2 = 0 \rightarrow x = -2m \rightarrow B(-2m, 0)$

$\textcircled{5} (1-m)x + 1 = 0 \rightarrow x = \frac{-1}{1-m} \rightarrow C(\frac{1}{m-1}, 0)$

$\Delta y = \frac{1}{m-1}, \Delta x = \frac{1}{m-1}$

$\frac{1}{\sqrt{2}} = \frac{|(0)(\frac{1}{m-1}) + (1)(\frac{1}{m-1}) - b|}{\sqrt{1 + 1}} = \frac{|b - \frac{1}{m-1}|}{\sqrt{2}}$

$b = \frac{1}{m-1} + \frac{1}{\sqrt{2}} \text{ or } b = \frac{1}{m-1} - \frac{1}{\sqrt{2}}$

$y = 2x - 3$

$M(1, -1)$

$\Delta y = -1, \Delta x = 1$

$\sqrt{2}$

$\frac{1}{\sqrt{2}} = \frac{|(1)(-1) + (1)(2) - b|}{\sqrt{1 + 1}} = \frac{|b - 1|}{\sqrt{2}}$

$b = 1 + \frac{1}{\sqrt{2}} \text{ or } b = 1 - \frac{1}{\sqrt{2}}$

$A(1, 2)$

$y = x + a \rightarrow m = 1$

$m' = -1 \rightarrow y = -x + b$

$-1 + 2 = 1 + a \rightarrow a = 1$

$-1 + b = 2 \rightarrow b = 3$

$A'(0, 3)$

$\frac{1}{\sqrt{2}} = \frac{|(0)(3) + (1)(1) - b|}{\sqrt{1 + 1}} = \frac{|b - 1|}{\sqrt{2}}$

$b = 1 + \frac{1}{\sqrt{2}} \text{ or } b = 1 - \frac{1}{\sqrt{2}}$