

معادله خط گزرنده از دو نقطه A و B $\rightarrow \frac{1-4}{2-4} = \frac{-3}{-2} = \frac{3}{2} \rightarrow -x - \frac{1}{2} = \frac{1}{2}$ $\rightarrow -x = \frac{1}{2} + \frac{1}{2} = 1 \rightarrow x = -1$

مختصات نقطه دقیقاً وسط پاره خط AB $\rightarrow x = \frac{4+2}{2} = 3$ و $y = \frac{1-4}{2} = 1 \rightarrow y = ax + b$
 $\rightarrow 1 = \frac{1}{2} \times 3 + b \rightarrow b = \frac{4}{2} = 2$
 $\rightarrow y = \frac{1}{2}x + 2$

معادله خط BC $\rightarrow \frac{1-3}{-4-1} = \frac{-2}{-5} = \frac{2}{5}$
 طول قلع $= \sqrt{(3-1)^2 + (-4-1)^2} = 5$

$y = \frac{2}{5}x + \frac{5}{5} \rightarrow b = \frac{5}{5} = 1$
 $3 = \frac{2}{5} \times 1 + b \rightarrow b = \frac{13}{5}$
 $y = \frac{2}{5}x + \frac{13}{5}$
 طول ارتفاع AH $= \frac{|-4 + \frac{13}{5} - 1|}{\sqrt{\frac{4}{25} + 1}} = \frac{|\frac{-10+13-5}{5}|}{\sqrt{\frac{29}{25}}} = \frac{2}{\sqrt{29}}$

فاصله دو خط موازی $= \frac{|14-2|}{\sqrt{4^2+2^2}} = \frac{12}{\sqrt{20}} = \frac{12}{2\sqrt{5}} = \frac{6}{\sqrt{5}}$
 مساحت دایره $= \left(\frac{6}{\sqrt{5}}\right)^2 \times \pi = \frac{36}{5} \pi$

مختصات نقطه M $\rightarrow x = \frac{4+2}{2} = 3$ و $y = \frac{1+3}{2} = 2 \rightarrow M(3, 2)$
 معادله خط AB $\rightarrow \frac{3-1}{2-4} = \frac{-2}{-2} = 1 \rightarrow 3 = 1 \times 2 + b \rightarrow b = 1 \rightarrow y = x + 1$
 معادله خط CH $\rightarrow a = 1 \rightarrow -3 = -1 \times 1 + b \rightarrow b = -2 \rightarrow y = x - 2$
 فاصله بین دو خط موازی $= \frac{|1-(-2)|}{\sqrt{1^2+1^2}} = \frac{3}{\sqrt{2}}$

$\frac{m+1}{2m-4} = \frac{5-m}{3m-2} \rightarrow 3m^2 + m - 2 = -2m^2 + 14m - 10$
 $\rightarrow 5m^2 - 13m + 8 = 0$
 $\Delta < 0 \rightarrow$ هیچ مقدار m

$$-x + 3 = 4x - 2 \rightarrow \boxed{x=1}, \boxed{y=\frac{2}{1}=2} \rightarrow A(1, 2)$$

$$-x + 3 = -2x + 1 \rightarrow \boxed{x=2}, \boxed{y=-1} \rightarrow B(2, -1)$$

$$2x - 1 = -x + 2 \rightarrow \boxed{x=\frac{3}{3}}, \boxed{y=\frac{1}{3}} \rightarrow C\left(\frac{3}{3}, \frac{1}{3}\right)$$

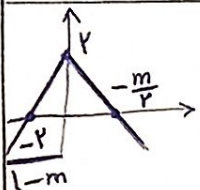
$$AM = \sqrt{\left(\frac{1}{3}\right)^2 + \left(\frac{2}{3}\right)^2} = \frac{\sqrt{5}}{3} \quad AH = \frac{|1+1-4|}{\sqrt{2}} = \sqrt{2} \rightarrow \frac{\frac{\sqrt{5}}{3}}{\sqrt{2}} = \boxed{\frac{5}{6}}$$

$$y = -\frac{1}{2}x + b \rightarrow \text{at } x=0, y=0 \rightarrow \frac{|b|}{\sqrt{\left(-\frac{1}{2}\right)^2 + 1}} = \frac{2\sqrt{5}}{\sqrt{5}} = 2$$

$$|b| = 2 \quad \text{و } \frac{5}{6} \rightarrow b = \frac{5}{6} \quad y = -\frac{1}{2}x + \frac{5}{6}$$

در جواب نهایی ندارد.

$$(1, 0) \text{ و } (0, 5) \rightarrow \sqrt{(1-0)^2 + (0-5)^2} = \boxed{5\sqrt{2}}$$

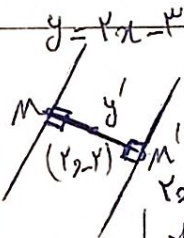


$$\left| \frac{-4 + m - m^2}{2(1-m)} \right| = \frac{5}{2} \rightarrow -2m^2 + 2m - 1 = -10m + 10 \rightarrow m^2 - 4m + 9 = 0$$

$$\boxed{m=3}$$

$$-2m^2 + 2m - 1 = 10m - 10 \rightarrow m^2 + 4m - 1 = 0 \rightarrow \boxed{\frac{c}{a} = -1}$$

$$\boxed{-1 \times 3 = -3}$$



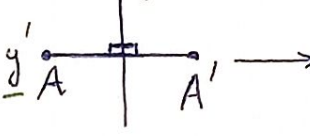
$$y = 2x - 3 \rightarrow a = -\frac{1}{2} \rightarrow -2 = 2x - \frac{1}{2} + b \rightarrow \boxed{b = -1}$$

$$2x - 3 = -\frac{1}{2}x - 1 \rightarrow y' = -\frac{1}{2}x - 1$$

$$\boxed{x = \frac{4}{5}}, \boxed{y = -\frac{1}{5}} \rightarrow 2 = \frac{4}{5} + x_{M'} \rightarrow x_{M'} = \frac{14}{5}$$

$$-2 = \frac{-\frac{1}{5}}{2} + y_{M'} \rightarrow y_{M'} = -\frac{13}{5} \rightarrow \frac{-13}{5} = 2 \times \frac{14}{5} - 9 \rightarrow \boxed{y' = 2x - 9}$$

$$y = x + 5$$



$$\rightarrow \boxed{a = -1} \rightarrow y' = -x + b$$

$$\boxed{b = 3} \leftarrow 2 = -1 + b \rightarrow y = -x + 3$$

$$\rightarrow -x + 3 = x + 5 \rightarrow 2x = -2 \rightarrow \boxed{x = -1}, \boxed{y = 4} \rightarrow -1 = \frac{1 + x_{A'}}{2}$$

$$\boxed{2b - a = 15} \quad a = -3 \leftarrow \boxed{y_{A'} = 6} \leftarrow 4 = \frac{2 + y_{A'}}{2} \quad \text{و} \quad \boxed{x_{A'} = -3}$$