

دست  
AB  $\begin{cases} \frac{x+2}{2} = 3 \\ \frac{x-4}{2} = 1 \end{cases} \quad (3, 1)$

$m_{AB} = \frac{1-4}{2-2} = -\infty \xrightarrow{\text{مماس}} m' = \frac{1}{\infty} \quad y-1 = \frac{1}{\infty}(x-3) \rightarrow y-1 = \frac{1}{\infty}x - \frac{3}{\infty} \Rightarrow \boxed{y = \frac{1}{\infty}x + \frac{1}{\infty}}$

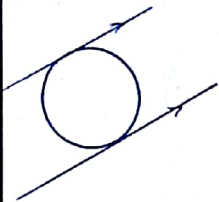
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$BC = \sqrt{(1-3)^2 + (-2+1)^2} = \sqrt{4+1} = \sqrt{5}$

$m_{BC} = \frac{1-3}{-2+1} = -\frac{2}{1} \rightarrow y-3 = -\frac{2}{1}(x+1) \rightarrow y-3 = -\frac{2}{1}x - \frac{2}{1} \Rightarrow y = -\frac{2}{1}x + \frac{5}{1} \Rightarrow y + 2x - 5 = 0$

فاصله از خط  $BC$  به  $A$  =  $\frac{|3+1(-5)-5|}{\sqrt{1^2+2^2}} = \frac{10}{\sqrt{5}} = 2\sqrt{5}$   $5-2=3$   
بیشتر است

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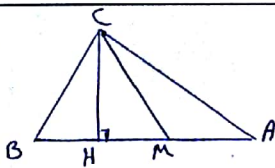


$(y-x-2=0) \times 2 \rightarrow 2y-2x-4=0$   
 $2y-2x-4=0 \xrightarrow{\text{مماس}} 2y-2x-4=0 \Rightarrow \boxed{a=2}$

فاصله از خط  $BC$  به  $A$  =  $\frac{|1-2+2|}{\sqrt{1^2+2^2}} = \frac{1}{\sqrt{5}} = \frac{4\sqrt{5}}{20} \rightarrow \text{مساحت دایره} = \frac{4\sqrt{5}}{10}$

مساحت دایره =  $\frac{1}{2} \times \frac{4\sqrt{5}}{10} \times \pi = \boxed{\frac{2\sqrt{5}}{5} \pi}$

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$m_{AB} = \frac{3-1}{2-2} = -\infty \rightarrow y-3 = -\infty(x-2) \rightarrow y = -\infty x + \infty$   
 $m_{CH} = 1 \rightarrow y+3 = 1(x+1) \Rightarrow y = x-2$   
 $H: -x + \infty = x-2$   
 $x = \frac{\infty}{2}$   
 $y = \frac{\infty}{2} - 2 = \frac{\infty}{2}$

M  $\begin{cases} \frac{x+2}{2} = 3 \\ \frac{x-4}{2} = 1 \end{cases}$

$MH = \sqrt{(\frac{\infty}{2}-3)^2 + (\frac{\infty}{2}-2)^2} = \sqrt{\frac{1}{2} + \frac{1}{2}} = \sqrt{\frac{2}{2}} = \boxed{\frac{\sqrt{2}}{2}}$

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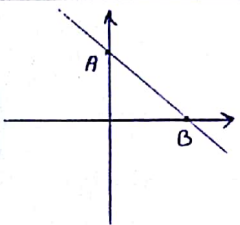
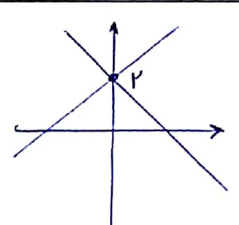
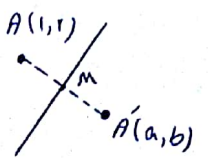
$3\delta \Rightarrow mm' = -1$

$\frac{m+1}{2m-2} = \frac{\infty-m}{2m-2} \rightarrow 2m^2-2m+2m-2 = 10m-2m^2-20+2m$

$2m^2+m-2 = -2m^2+10m-20 \rightarrow 4m^2-9m+18=0 \Rightarrow \Delta < 0$  پس جواب ندارد

$\boxed{m \text{ ندارد}}$

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| $\left. \begin{array}{l} AB: x+ry=r \\ AC: -\varepsilon m+ry=-r \end{array} \right\} \rightarrow A(1,1)$ $\frac{\omega x = 0 \Rightarrow m=1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | $\left. \begin{array}{l} AB: x+ry=r \\ BC: x+y=\varepsilon \end{array} \right\} \rightarrow B(\omega,-1)$ $y=-1$                                                                                                                                                                                                                                                                                        | $\left. \begin{array}{l} AC: y-rm=-1 \\ BC: y+x=\varepsilon \end{array} \right\} \rightarrow C\left(\frac{\omega}{r}, \frac{r}{r}\right)$ $-rm = -\omega \Rightarrow m = \frac{\omega}{r}$<br>$M(B \text{ bis}) \left\{ \begin{array}{l} \frac{\omega + \frac{\omega}{r}}{r} = \frac{r}{r} = \frac{1}{r} \\ \frac{-1 + \frac{r}{r}}{r} = \frac{\varepsilon}{r} = \frac{r}{r} \end{array} \right. \quad \left. \begin{array}{l} \overline{AM} = \sqrt{\left(\frac{1}{r}-1\right)^2 + \left(\frac{r}{r}-1\right)^2} = \frac{\omega\sqrt{r}}{r} \\ \overline{AH} = \frac{ 1+1-\varepsilon }{\sqrt{1+1}} = \frac{r}{\sqrt{r}} = \sqrt{r} \end{array} \right\} \rightarrow \frac{AM}{AH} = \frac{\frac{\omega\sqrt{r}}{r}}{\sqrt{r}} = \boxed{\frac{\omega}{r}}$ | 6  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | $d(A, \text{line}) = \frac{ C }{\sqrt{\frac{1}{\varepsilon} + 1}} = \sqrt{r_0} \rightarrow C = \sqrt{r_0} = \omega \rightsquigarrow y = -\frac{1}{r}x + \omega$ $A: y = -\frac{1}{r}(0) + \omega \Rightarrow y = \omega \quad A(0, \omega)$ $B: 0 = -\frac{1}{r}x + \omega \Rightarrow x = \omega \quad B(\omega, 0)$<br>$AB = \sqrt{(\omega-0)^2 + (0-\omega)^2} = \sqrt{1+\omega^2} = \omega\sqrt{a}$ | $y = -\frac{1}{r}x + \omega$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 7  |
| $\left\{ \begin{array}{l} my - \varepsilon x - rm \rightarrow my = \varepsilon x + rm \Rightarrow y = \frac{\varepsilon}{m}x + r \\ y + mx = x + r \rightarrow y = mx + x + r \Rightarrow y = (1+m)x + r \end{array} \right.$ $\Rightarrow y = \frac{\varepsilon}{m}x + r \xrightarrow{y=0} 0 = \frac{\varepsilon}{m}x + r \Rightarrow x = -\frac{r}{\frac{\varepsilon}{m}} = -\frac{rm}{\varepsilon}$ $\Rightarrow y = (1+m)x + r \xrightarrow{y=0} 0 = (1+m)x + r \Rightarrow x = -\frac{r}{1+m}$ $\left  \frac{m}{\varepsilon} + \frac{1}{1+m} \right  = \frac{\omega}{\varepsilon} \rightarrow \frac{m-m^2+\varepsilon}{-\varepsilon m + \varepsilon} = \frac{\pm \omega}{\varepsilon} \Rightarrow \left\{ \begin{array}{l} (m-r)^2 \Rightarrow m=r \\ m^2 + \varepsilon m - 1 \Rightarrow m = -r\sqrt{a}, m = -r/\sqrt{a} \end{array} \right.$ | $S = \frac{1}{r} \times r \times (x_r - x_1) = \frac{\omega}{r}$ $x_r - x_1 = -r \left( \frac{m}{\varepsilon} + \frac{1}{1+m} \right) = \frac{\omega}{r}$ $\frac{\omega}{r} \cdot \frac{1}{r} = \frac{1}{r} \times r \times (x_r - x_1) = \frac{\omega}{r}$                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8  |
| $x' = x + r \Rightarrow x = x' - r$ $y' = y - r \Rightarrow y = y' + r$<br>$y' + r = r(x' - r) - r \Rightarrow y' + r = rx' - \varepsilon - r \Rightarrow \boxed{y' = rx' - \omega}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 9  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | $mm' = -1 \rightarrow y = x + \omega \Rightarrow m=1 \quad m' = -1 \Rightarrow y - r = -1(m-1) \Rightarrow$ $y - r = -x + 1 \Rightarrow y = -x + r$ $M(x, y) \rightarrow x + \omega = -x + r \rightarrow rx = -r \Rightarrow x = -1 \quad y = -1 + \omega = \varepsilon \quad M(-1, \varepsilon)$                                                                                                       | $\left\{ \begin{array}{l} \frac{1+\omega}{r} = -1 \Rightarrow \omega = -r \\ \frac{r+b}{r} = \varepsilon \Rightarrow b = \varepsilon \end{array} \right. \rightarrow A'(-r, \varepsilon)$ $rb - \omega = r(\varepsilon) - (-r) = r\varepsilon + r = \boxed{1\omega}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10 |