

1. $S_{ABCD} = (AB)^2 \rightarrow \sqrt{(m-k)^2 + (t+r)^2} = \sqrt{9+25} = \sqrt{34} \Rightarrow S \in \Delta$

$m_{AB} = -\frac{1}{t} = \frac{m-k}{t+r} \Rightarrow m-k = -t \quad (*)$

2. $x_A + x_C = x_B + x_D \rightarrow -1+x = 2-1-x \rightarrow x = \frac{1}{2} \quad (*)$

$m_{AB} = \frac{-2}{t} = \frac{-1}{y-1} \Rightarrow 2y-2 = -4 \Rightarrow y = -1$

$AB = \sqrt{14+9} = 5$

$BC = \sqrt{9_{\frac{1}{4}} + 2} = \frac{5}{2}$

$\rightarrow P = x(5) + x(\frac{5}{2}) = 15$

3. $y = \frac{-tm}{m^2-1}x + \frac{t}{m^2-1} \quad \tan \theta = \sqrt{2} \Rightarrow \frac{t}{m^2-1} = \sqrt{2}$

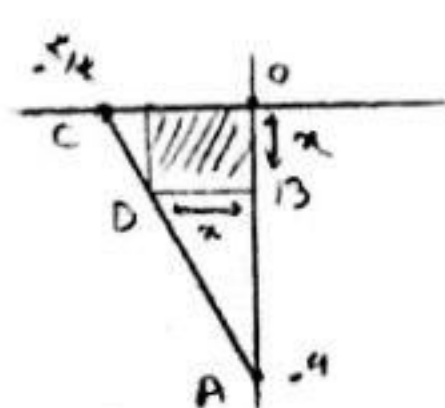
$\frac{-tm}{m^2-1} = \sqrt{2} \rightarrow \sqrt{2}m^2 + tm - \sqrt{2} = 0 \rightarrow \frac{\sqrt{2}}{1 \pm 1} = \frac{\sqrt{14}}{\sqrt{2}} = \frac{t}{\sqrt{2}}$

4. $m_{BC} = \frac{11-2}{5-2} = 3 \Rightarrow y-2 = 3(x-2) \Rightarrow y = 3x-4$

$AH = \frac{|3(1) - 2 - 4|}{\sqrt{3^2+1}} = \frac{3}{\sqrt{10}}$

5. $B \text{ س } \begin{cases} 2y-7x = -19 \\ y+2x = 5 \end{cases} \rightarrow \begin{cases} 2y-7x = -19 \\ -2y-4x = 10 \end{cases} \Rightarrow B(2, 1)$

$BH = \frac{|2(1) - 5(2) - 17|}{\sqrt{14+9}} = \frac{22}{5}$



6. $\frac{4-x}{4} = \frac{x}{5/4} \Rightarrow x = \frac{5}{4}$

$\sqrt{2}x = \frac{5\sqrt{2}}{4}$

$y = ax + 1$ $\xrightarrow{\text{موازی ایند}}$ $a = \frac{1}{a} \Rightarrow a = \pm 1$ $\xrightarrow{ra = -1}$ $a = -1$ $\Rightarrow y = -x + 1$
 $y = \frac{x}{a} + 1 - a$ $\xrightarrow{ra = 1}$ $a = 1$ $\Rightarrow y = x + 1$

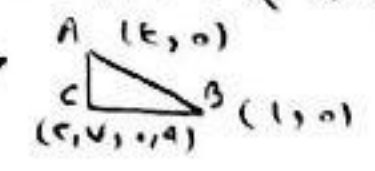
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$\rightarrow$ عرض: $\frac{|c'-c|}{\sqrt{a'^2+b'^2}} = \frac{r_r}{r} \rightarrow r_r = \frac{a}{x} \rightarrow x = \sqrt{r^2 - \frac{1}{r^2}} = \frac{\sqrt{r^2}}{r}$
 $\Rightarrow S = \frac{r_r}{r} \times \frac{\sqrt{r^2}}{r} = \frac{1}{r} = 2, 5$

شیب قائم الزویه است: $x - 3y = 1 \rightarrow y = \frac{x}{3} - \frac{1}{3}$ / $AH = \frac{|1 - 3(0) - 1|}{\sqrt{1+9}} = \frac{2}{\sqrt{10}}$ $\xrightarrow{AC \perp BC}$ $m_{AC} = -\frac{3}{1}$

$y = 0 \Rightarrow -\frac{1}{3} = -\frac{1}{3}(x - 1) \rightarrow y = -\frac{1}{3}x + \frac{1}{3}$ / C است: $-\frac{1}{3}x + \frac{1}{3} = \frac{x}{3} - \frac{1}{3} \Rightarrow x = 2, y = 0$

شیب در دو نقطه اول است $\rightarrow 0 = \frac{x}{3} - \frac{1}{3} \Rightarrow x = 1$ $\Rightarrow A(1, 0)$
 $S: \begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 1 \\ 1 & 1 & 1 \end{bmatrix} \times \frac{1}{2} = 1, 2, 5$



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$m = \sqrt{r^2} = \frac{a-b}{-1/r + 1/r} \Rightarrow a-b = \frac{-\sqrt{r^2}}{2}$ $\left\{ \begin{array}{l} \text{مساحت} = \sqrt{r^2} \times \frac{\sqrt{r^2}}{2} \\ \text{قطر} = \frac{\sqrt{r^2}}{2} \end{array} \right.$

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$AB = \sqrt{(\frac{\sqrt{r^2}}{2})^2 + (\frac{1}{2})^2} = \frac{1}{2}$

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

خط عمود بر L و میانس بر دایره می باشد و مرکز دایره است $y = \frac{3}{4}x + c$ (۲)

$r = \sqrt{14+9} = 5$

$\rightarrow \frac{|c|}{\sqrt{(\frac{3}{4})^2 + 1}} = \frac{r}{5} \rightarrow |c| = \frac{4r}{5} \Rightarrow c = \pm \frac{4 \times 5}{5} = \pm 4$ $\xrightarrow{\text{حالت ۱}}$ $y = \frac{3}{4}x + \frac{4}{5}$

$\begin{cases} \frac{3}{4}x + \frac{4}{5} = y \\ x + 2y = 2 \end{cases} \xrightarrow{\text{حذف}} \begin{cases} x = -\frac{1}{2} \\ y = \frac{3}{4} \end{cases} \rightarrow \left[-\frac{1}{2}, \frac{3}{4} \right]$