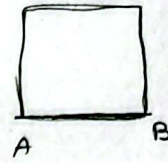


$$m = \frac{\Delta y}{\Delta x} \Rightarrow -\frac{1}{4} = \frac{m-k}{4-(-2)} \Rightarrow m-k = -2$$

$$AB = \sqrt{(4-(-2))^2 + (m-k)^2} = \sqrt{4^2 + 2^2}$$

$$S = AB^2 = 4^2 + 2^2 = \boxed{20}$$



۱

$$m_{AB} = \frac{4-1}{-1-2} = -\frac{3}{3} \Rightarrow m_{BC} = \frac{4}{3} \quad B \in BC \Rightarrow \text{خط } BC: y = \frac{4}{3}x - 2$$

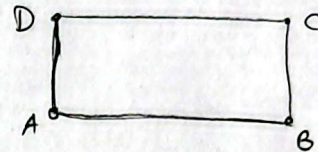
$$m_{CD} = m_{AB} = -\frac{4}{3}$$

$$\Rightarrow \frac{y+2-y}{-1-x-x} = -\frac{4}{3} \Rightarrow 2x+1=4 \Rightarrow x=\frac{3}{2}$$

$$y = \frac{4}{3} \times \frac{3}{2} - 2 = -1 \Rightarrow C = \left(\frac{3}{2}, -1\right) \quad \overline{BC} = \sqrt{\left(\frac{3}{2}\right)^2 + 2^2} = \sqrt{\frac{9}{4} + 4} = \sqrt{\frac{25}{4}} = \frac{5}{2}$$

$$\overline{AB} = \sqrt{4^2 + 2^2} = \boxed{5}$$

$$\text{مساحت} = 2\left(\frac{5}{2} \times 5\right) = \boxed{25}$$



۲

$$\tan \alpha = \frac{-2m}{m^2-1} \Rightarrow \frac{-2m}{m^2-1} = \tan 45^\circ = 1 \Rightarrow \sqrt{3}m^2 - \sqrt{3} + 2m = 0$$

$$\frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{4+12}}{\sqrt{3}} = \boxed{\frac{4\sqrt{3}}{3}}$$

۳

$$m_{BC} = \frac{11-2}{2-2} = \frac{9}{0} \Rightarrow$$

$$B \in BC \Rightarrow y-2=2(x-2) \Rightarrow y=2x-2$$

$$BC: 2x-y-2=0$$

$$A = (1, 9)$$

$$AH = \text{فاصله } A \text{ از } BC = \frac{|2-9-2|}{\sqrt{2^2+1^2}} = \frac{10}{\sqrt{5}} = \boxed{2\sqrt{5}}$$

۴

$$AB \cap BC = B \Rightarrow$$

$$\begin{cases} y+2x=5 \\ 2y-2x=-19 \end{cases} \Rightarrow x=\frac{19-15}{4} = 1, y=1 \quad B=(1,1)$$

$$AC \text{ از } B \text{ فاصله} = AH =$$

$$AC: -2x+4y-14$$

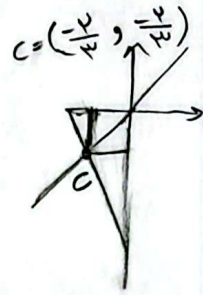
$$\frac{|-9+4-14|}{\sqrt{4+16}} = \frac{19}{\sqrt{20}} = \boxed{\frac{19\sqrt{5}}{2}}$$

۵

$$(-\frac{4}{\sqrt{5}}, 0), (0, -4) \in l \Rightarrow m = \frac{-4-0}{0-(-\frac{4}{\sqrt{5}})} = \frac{-4}{\frac{4}{\sqrt{5}}} = -\sqrt{5}$$

$$l: y - (-4) = -\sqrt{5}(x - 0) \Rightarrow y = -\sqrt{5}x - 4 \quad \left. \begin{array}{l} y = -\sqrt{5}x - 4 \\ y = x \end{array} \right\} \Rightarrow x = \frac{-4}{\sqrt{5}+1} \quad y = \frac{-4}{\sqrt{5}+1}$$

$$\text{مقطع} = C \text{ و نقطة مبدأ} = \sqrt{(\frac{-4}{\sqrt{5}+1})^2 + (\frac{-4}{\sqrt{5}+1})^2} = \boxed{\frac{4\sqrt{2}}{\sqrt{5}+1}}$$



$$I) \quad y = x + 1$$

$$\leftarrow a = \pm 1 \quad \leftarrow \frac{1}{a} = a \quad \leftarrow \text{دوائر متقابلين موازيين}$$

$$II) \quad y = -x + 1$$

ل

دائرة حالت نقطة
دائرة:



$$x^2 + \frac{1}{4} = 40 \Rightarrow x = \sqrt{40.5}$$

$$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

بالتوجه من قطر دائرة دو خط دیگر را
بندها می کنیم.

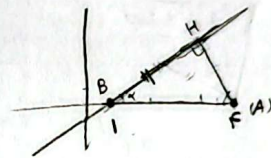
$$S = (x) \left(\frac{\sqrt{2}}{2} \right) = (\sqrt{40.5}) \left(\frac{\sqrt{2}}{2} \right) = \sqrt{14.40} = \boxed{3.8}$$

$$AH = \frac{|1-1|}{\sqrt{1+9}} = \frac{0}{\sqrt{10}} = 0$$

$$m_{BC} = \frac{1}{\sqrt{5}} \Rightarrow m_{AH} = -\sqrt{5}$$

$$\max S = \max \text{توان}$$

$$\tan \alpha = \frac{1}{\sqrt{5}} \Rightarrow \alpha < 45^\circ \Rightarrow AH < BH$$



$$AH = \text{ارتفاع} \Rightarrow \text{اگر حالت قائم الزاویه} \Rightarrow BH: \text{توان} \int BH > AH$$

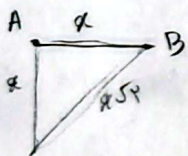
$$\triangle ABH \cong \text{ثلاث افروض}$$

$$AH = -\sqrt{5}x + 1 \quad x = \frac{1}{\sqrt{5}} \Rightarrow y = \frac{1}{\sqrt{5}} \Rightarrow \left(\frac{1}{\sqrt{5}}, \frac{1}{\sqrt{5}} \right) \in ABH$$

$$\tan \alpha = \frac{1}{\sqrt{5}} \Rightarrow 1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow 1 + \frac{1}{5} = \frac{1}{\cos^2 \alpha} \Rightarrow \cos^2 \alpha = \frac{5}{6} \Rightarrow \cos \alpha = \frac{\sqrt{30}}{6}$$

$$S_{ABH} = \frac{1}{2} AB \cdot AH \cdot \sin(90^\circ - \alpha) = \frac{1}{2} \times \frac{1}{\sqrt{5}} \times \frac{1}{\sqrt{5}} \times \cos \alpha = \frac{1}{10} \times \frac{\sqrt{30}}{6} = \boxed{\frac{1}{10}}$$

$$D = \frac{b-a}{\frac{1}{\sqrt{5}} + \frac{1}{\sqrt{5}}} = \frac{b-a}{\frac{2}{\sqrt{5}}} = \sqrt{5} \Rightarrow b-a = \frac{\sqrt{5}}{2}$$



$$AB = \sqrt{(b-a)^2 + \left(-\frac{1}{\sqrt{5}} + \frac{1}{\sqrt{5}}\right)^2} = \sqrt{\frac{5}{4} + \frac{1}{4}} = \frac{1}{\sqrt{2}}$$

$$\text{قطر} = AB \cdot \sqrt{2} = \boxed{\frac{\sqrt{2}}{\sqrt{2}}}$$

$$BA = AO = \sqrt{4^2 + 4^2} = 4\sqrt{2}$$

$$m_{AO} = \frac{-4-0}{-4-0} = 1 \Rightarrow AO: \frac{1}{\sqrt{2}}x = y$$

مربع ABCO

$$m_{AB} = -\frac{1}{\sqrt{2}}$$

$$AB: y = -\frac{1}{\sqrt{2}}x - \frac{4\sqrt{2}}{\sqrt{2}}$$

$$BC: \frac{1}{\sqrt{2}}x + b = y$$

$$BC, AO \text{ متوازيين: } \frac{|b-0|}{\sqrt{\frac{1}{2}+1}} = \frac{b}{\sqrt{3/2}} = 4 \Rightarrow b = \frac{4\sqrt{6}}{\sqrt{3}} = 4\sqrt{2}$$

$$\left. \begin{array}{l} -\frac{1}{\sqrt{2}}x - y = \frac{4\sqrt{2}}{\sqrt{2}} \\ \frac{1}{\sqrt{2}}x - y = \frac{4\sqrt{2}}{\sqrt{2}} \end{array} \right\} \Rightarrow \boxed{x = -4} \quad \boxed{y = +4}$$

$$\boxed{x = +4} \quad \boxed{y = +4}$$

