

۱۷، ۵

$$A(-2, k) \rightarrow \text{خط} \rightarrow m = -\frac{1}{p} \rightarrow m = \frac{\Delta y}{\Delta x} = \frac{k-m}{-2-f} = \frac{k-m}{-4} = -\frac{1}{4} \rightarrow k-m=3$$

$$B(f, m) \rightarrow \text{خط} \rightarrow m = -\frac{1}{p}$$

$$\rightarrow \text{فاصله} = |AB| = \sqrt{(k-m)^2 + (-2-f)^2} = \sqrt{(3)^2 + (-4)^2} = \sqrt{9+16} = \sqrt{25} = 5 \rightarrow \text{پس ضلع مربع}$$

$$S = a^2 = (\sqrt{25})^2 = 25 \checkmark$$

$$\begin{cases} A(-1, 4) \\ B(2, 1) \\ C(x, y) \\ D(-1-m, y+3) \end{cases} \rightarrow C, D \rightarrow \text{مربع} \rightarrow \overline{CD} = \sqrt{(x+1+m)^2 + (y+3-y)^2} = \sqrt{(x+1+m)^2 + 9}$$

$$\rightarrow \overline{AB} = \sqrt{(-1-2)^2 + (4-1)^2} = \sqrt{14+9} = 5 \checkmark$$

$$\rightarrow \text{دو ضلع روبه روبه و دو ضلع موازی} \Rightarrow \sqrt{(x+1+m)^2 + 9} = \sqrt{25} \rightarrow (x+1+m)^2 = 16 \rightarrow x+1+m = \pm 4$$

$$\rightarrow \overline{AB} = \overline{CD} = 5 \rightarrow \overline{AD} = \sqrt{(m_y - m_x)^2 + (y_r - y_l)^2} = \sqrt{2^2 + 1^2} = \sqrt{5} = \frac{5}{\sqrt{2}} \checkmark$$

$$\rightarrow 2(\overline{AB} + \overline{AD}) = 2(5 + \frac{5}{\sqrt{2}}) = 10 + 5\sqrt{2}$$

$$2mx + (m^2 - 1)y = 3 \rightarrow \text{ضلع} = m = \frac{-a}{b} \rightarrow \begin{cases} -2m \\ m^2 - 1 \end{cases} = \sqrt{3}$$

$$\alpha = 40^\circ \rightarrow \tan \alpha = \tan 40^\circ = \sqrt{3} \rightarrow \text{نسبت}$$

$$m = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-2 \pm \sqrt{4+12}}{2\sqrt{3}} = \frac{-2 \pm 4}{2\sqrt{3}} \rightarrow \begin{cases} \frac{1}{\sqrt{3}} \\ -\frac{3}{\sqrt{3}} \end{cases}$$

$$\rightarrow \Delta = |- \sqrt{3} - \frac{\sqrt{3}}{3}| = |-\frac{4\sqrt{3}}{3}| = \frac{4\sqrt{3}}{3} \checkmark$$

$$A(1, 9) \rightarrow AH: y = -\frac{1}{p}x + 9, 5$$

$$B(3, 3) \rightarrow m = \frac{\Delta y}{\Delta x} = \frac{11-3}{v-3} = \frac{8}{f} = 2 \rightarrow y = 2x + (-3)$$

$$C(v, 11) \rightarrow y = 2x - 3 \rightarrow -\frac{1}{p}x + 9, 5 = 2x - 3 \rightarrow 2, 5x = 12, 5 \rightarrow x = 5$$

$$\rightarrow y = 2x - 3 \rightarrow y = 7$$

$$\rightarrow AH = \sqrt{(5-1)^2 + (9-7)^2} = \sqrt{16+4} = \sqrt{20} = 2\sqrt{5} \checkmark$$

$$\begin{cases} AB: y+2x=7 \\ AC: fy-3x=14 \\ BC: fy-vx=-19 \end{cases} \rightarrow \begin{cases} AC: fy-3x=14 \\ BH: fx+3y=15 \end{cases} \rightarrow f(3)+3(1)=15$$

$$\rightarrow \begin{cases} AB: y+2x=7 \\ BC: fy-vx=-19 \end{cases} \rightarrow \begin{cases} x=3 \\ y=1 \end{cases}$$

$$BH = ? \rightarrow \begin{cases} AC: fy-3x=14 \\ BH: fx+3y=15 \end{cases} \rightarrow \begin{cases} x=0, 34 \\ y=5, 152 \end{cases} \rightarrow B(3, 1) \rightarrow H(\frac{34}{100}, \frac{152}{100})$$

$$\rightarrow BH = \sqrt{(3-0,34)^2 + (1-1,52)^2} = \sqrt{(2,66)^2 + (-0,52)^2} = \sqrt{7,0756+0,2704} = \sqrt{7,346} = 2,71 \checkmark$$

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قطر مربع هاشور خورده = ؟

$A(0,0) \rightarrow A, B, C \rightarrow \text{روی یک خط است} \rightarrow m_{AB} = m_{AC} \rightarrow B(x, -x-4)$ (۲)

$m = \frac{\Delta y}{\Delta x} = \frac{-4}{\frac{4}{3}} = \frac{3}{4} = -1 \Rightarrow \begin{cases} m = -1 \\ b = -4 \end{cases} \rightarrow y = -x - 4$

مساحت اضلاع برابر هستند $\Rightarrow x = -x - 4 \rightarrow 4 = -2x \rightarrow x = -2$

قطر = $\sqrt{2}a = \sqrt{2}x = \left| \sqrt{2} \times \frac{4}{3} \right| = \frac{4\sqrt{2}}{3}$ ✓

$y - ax = 1$
 $ay - x = a - 1$

موازی هستند $\rightarrow m_1 = m_2 \rightarrow \begin{cases} m_1 = a \\ m_2 = \frac{1}{a} \end{cases} \rightarrow a = \frac{1}{a} \rightarrow a^2 = 1 \rightarrow a = \pm 1$ (۲)

دو حالت $\begin{cases} a = +1 \rightarrow \begin{cases} y - x = 1 \\ y - x = 0 \end{cases} \rightarrow \text{نقطه } (1, 2) \rightarrow \text{✓} \\ a = -1 \rightarrow \begin{cases} y + x = 1 \\ -y - x = -2 \end{cases} \rightarrow \text{نقطه } (1, 2) \rightarrow \text{✓} \end{cases}$

مساحت = ؟

فاصله دو خط $\begin{cases} y - x = 1 \\ y - x = 0 \end{cases} \rightarrow \text{فاصله} = \frac{|c - c'|}{\sqrt{a^2 + b^2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\Rightarrow x^2 + \left(\frac{\sqrt{2}}{2}\right)^2 = 25 \rightarrow x^2 = 25 - \frac{1}{2} = \frac{49}{2} \rightarrow x = \frac{7}{\sqrt{2}} \Rightarrow S = ab = \frac{1}{\sqrt{2}} \times \frac{7}{\sqrt{2}} = \frac{7}{2}$ ✓

$A(4,0)$

فاصله A به خط $\frac{|x - 3y - 1|}{\sqrt{1+9}} = \frac{|4 - 1|}{\sqrt{10}} = \frac{3}{\sqrt{10}}$ ✓

* از اینجا که صورت سوال گفته فاصله ی رأس A از خط قطع مثلث برابر با فاصله ی رأس B از خط است پس متوجه می شویم مثلث قائم الزامی است!

$S_{\max} = \frac{h \times \text{مساحت}}{2} = \frac{\frac{3}{\sqrt{10}} \times A}{2}$

جواب صفحه ۲ اخذ ...

$(-\frac{1}{4}, a)$
 $(-\frac{1}{4}, b)$

در اس می آید $\rightarrow \Delta$ خط $\begin{cases} \text{نقطه} \rightarrow m_{\Delta} = \frac{\Delta y}{\Delta x} = \frac{b-a}{-\frac{1}{4} - (-\frac{1}{4})} = \frac{b-a}{\frac{1}{4}} = 4(b-a) \\ \text{نقطه} \Rightarrow b-a = \frac{\sqrt{3}}{4} \end{cases}$ (۲)

$m_{\Delta} = \sqrt{3}$

قطر مربع = ؟ فاصله ی دو نقطه = $\sqrt{(b-a)^2 + (-\frac{1}{4} - (-\frac{1}{4}))^2} = \sqrt{\left(\frac{\sqrt{3}}{4}\right)^2 + \left(\frac{1}{4}\right)^2} = \sqrt{\frac{3}{16} + \frac{1}{16}} = \sqrt{\frac{4}{16}} = \frac{1}{2}$

$S_{\text{مربع}} = (\text{ضلع})^2 = \left(\frac{\text{قطر}}{2}\right)^2 \Rightarrow \text{قطر} = \sqrt{2(\text{ضلع})^2} \rightarrow \sqrt{2 \times \left(\frac{1}{2}\right)^2} = \sqrt{\frac{2}{4}} = \sqrt{\frac{1}{2}} = \frac{\sqrt{2}}{2}$ ✓

$(-3, -4)$

$r = \text{شعاع} = \sqrt{3^2 + 4^2} = 5$

$\begin{cases} m_{l'} = \frac{\Delta y}{\Delta x} = \frac{-4-0}{-3-0} = \frac{4}{3} \\ m_{l'} = -\frac{3}{4} \end{cases}$

$\begin{cases} l: y = -\frac{3}{4}x + (-4, 25) \rightarrow \text{نقطه } (-3, -4) \\ l': y = \frac{4}{3}x + \frac{25}{3} \rightarrow \text{نقطه } (3, 25) \end{cases}$ (۱)

خط تقاطع دو خط $\begin{cases} y = -\frac{3}{4}x - 4 \\ y = \frac{4}{3}x - \frac{25}{3} \end{cases} \rightarrow \begin{cases} x = -7 \\ y = -1 \end{cases}$

نقطه ی تقاطع $(-7, -1)$

