

پریا امین

$$a = \frac{m-k}{4-(-2)} = -\frac{1}{2} \rightarrow 2m-2k = -4 \rightarrow m-k = -2 \quad (5)$$

فاصلہ دو نقطہ $\sqrt{(m-k)^2 + (4-(-2))^2} = \sqrt{9 + 36} = \sqrt{45} = 3\sqrt{5}$
ضلع مربع

$$(3\sqrt{5})^2 = 9 \times 5 = 45$$

$$h_A + h_C = h_B + h_D \rightarrow -1 + h = 3 - 1 - h \rightarrow$$

$$2h = 3 \rightarrow h = \frac{3}{2} \quad (5)$$

$$10 \quad AB = \sqrt{(4-1)^2 + (-1-3)^2} = \sqrt{9+16} = \sqrt{25} = 5$$

$$m_{AB} \times m_{AD} = -1 \rightarrow \frac{3(y-1)}{4} = -1 \rightarrow 3y-3 = -4 \rightarrow 3y = -1 \rightarrow y = -\frac{1}{3}$$

$$L \rightarrow -\frac{3}{2} \quad L \rightarrow -\frac{y-1}{1/5}$$

$$15 \quad AD = \sqrt{(-2, 5 - (-1))^2 + (2-4)^2} = \sqrt{(-1, 5)^2 + (-2)^2} = \sqrt{1+25+4} = \sqrt{30}$$

$$= 2(5)$$

$$k_3: 2(5+2(5)) = 2(15) = 30$$

پیدا اسی

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$$2m^2 + (m^2 - 1)y = 3 \rightarrow (m^2 - 1)y = -2m^2 + 3$$

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$$y = \frac{-2m^2 + 3}{m^2 - 1} = \frac{-2m}{m^2 - 1}x + \frac{3}{m^2 - 1}$$

$$(K) \text{ شیب: } \frac{-2m}{m^2 - 1}$$

$$|\tan 45^\circ| = |\sqrt{3}| = \sqrt{3}$$

$$\frac{-2m}{m^2 - 1} = \pm \sqrt{3} \rightarrow \frac{-2m}{m^2 - 1} = \sqrt{3} \rightarrow -2m = \sqrt{3}(m^2 - 1) \rightarrow$$

$$-2m = \sqrt{3}m^2 - \sqrt{3} \rightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0$$

$$m = \frac{-2 \pm \sqrt{4 - 4(\sqrt{3})(-\sqrt{3})}}{2\sqrt{3}} = \frac{-2 \pm 4}{2\sqrt{3}} \rightarrow m_1 = \frac{1}{\sqrt{3}}, m_2 = -\sqrt{3}$$

$$\frac{-2m}{m^2 - 1} = -\sqrt{3} \rightarrow -2m = -\sqrt{3}(m^2 - 1) \rightarrow$$

$$-2m = -\sqrt{3}m^2 + \sqrt{3} \rightarrow \sqrt{3}m^2 - 2m - \sqrt{3} = 0$$

$$m = \frac{2 \pm \sqrt{(-2)^2 - 4(\sqrt{3})(-\sqrt{3})}}{2\sqrt{3}} = \frac{2 \pm 4}{2\sqrt{3}} \rightarrow m_3 = \sqrt{3}, m_4 = -\frac{1}{\sqrt{3}}$$

چون در صورت سوال گفته با جهت "مثبت" محور ها فقط

قابل قبول $-\sqrt{3}$ و $\frac{1}{\sqrt{3}}$

می باشد

$$\left| -\sqrt{3} - \frac{1}{\sqrt{3}} \right| = \frac{|-3-1|}{\sqrt{3}} = \frac{4}{\sqrt{3}}$$

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برای احصی

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$$\text{مقادیر } BC \rightarrow m = \frac{11 - 3}{4 - 3} = \frac{8}{1} = 8$$

$$BC(x, y) \rightarrow y = mx + b \rightarrow 3 = 2(3) + b \rightarrow 3 = 6 + b \rightarrow b = -3$$

$$BC: y = 2x - 3$$

$$BC \text{ از } A \text{ فاصله} = \frac{|y - 2x + 3|}{\sqrt{5}} \rightarrow \frac{|9 - 2(1) + 3|}{\sqrt{5}} = \frac{10}{\sqrt{5}} = 2\sqrt{5}$$

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B خطی: BC و AB بر فرض

$$AB: y = -2x + 4$$

$$BC: 2y = 4x - 19 \rightarrow y = \frac{2}{1}x - \frac{19}{2} \quad BH = \frac{|4 - 9 - 19|}{5} = \frac{24}{5}$$

$$\text{بر فرض: } -2x + 4 = \frac{2}{1}x - \frac{19}{2} \rightarrow 0.1x = 19.5 \rightarrow x = \frac{19}{2}$$

$$x = \frac{19}{2}, y = -2\left(\frac{19}{2}\right) + 4 = -19 + 4 = -15$$

$$AC \text{ از } B \text{ فاصله} = \frac{|4y - 2x - 19|}{\sqrt{14 + 9}} = \frac{|4\left(\frac{19}{2}\right) - 2\left(\frac{19}{2}\right) - 19|}{5} = \frac{11}{5}$$

$$\frac{11}{5}$$

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$$(-\frac{3}{4}, 0) \quad (0, -4)$$

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$$m = \frac{0 - (-4)}{-\frac{3}{4} - 0} = \frac{4}{-\frac{3}{4}} = \frac{4 \cdot 4}{-3} = -\frac{16}{3}$$

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$$y = mx + b \rightarrow -4 = -\frac{16}{3}(0) + b \rightarrow b = -4$$

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$$y = -\frac{16}{3}x - 4$$

نقطه به صورت قطر و خط روی خط $y = x$ قرار دارد پس

$$x = -\frac{16}{3}x - 4 \rightarrow 9x = -4 \rightarrow x = -\frac{4}{9} = -\frac{4}{9}$$

$$y = -\frac{4}{9}$$

10 فاصله جدا از

$$\text{نقطه} \rightarrow \sqrt{\left(-\frac{4}{9}\right)^2 + \left(-\frac{4}{9}\right)^2} = \sqrt{\frac{16}{81} + \frac{16}{81}} = \frac{4}{9}\sqrt{2}$$

قطر مربع

$$y - ax = 1 \quad d_1$$

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$$ay - x = a - 1 \quad d_2$$

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$$d_1 \Rightarrow y = ax + 1 \quad m_1 = a$$

$$d_2 \Rightarrow y = \frac{x + a - 1}{a} \quad m_2 = \frac{1}{a}$$

$$\left. \begin{array}{l} \text{موازی} \rightarrow m_1 = m_2 \rightarrow \\ a = \frac{1}{a} \rightarrow a^2 = 1 \rightarrow a = \pm 1 \end{array} \right\}$$

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$$a = 1 \rightarrow d_1: y - x = 1$$

$$d_2: y - x = 0$$

$$\left. \begin{array}{l} P(x, y) \\ d_1: x - 1 = 1 \checkmark \\ d_2: x - 1 = 0 \times \end{array} \right\}$$

پس $a = 1$ است و P روی d_1 است

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نقطه ای

$$a = -1$$

$$d_1: y - (-1)x = 1 \rightarrow y + x = 1$$

$$d_2: -1y - x = -1 - 1 \Rightarrow -y - x = -2 \rightarrow y + x = 2$$

$$P(1, 2) \rightarrow d_1: 2 + 1 = 1 \times$$

$$d_2: 2 + 1 = 2 \times$$

نقطه $a = -1$ روی خط P است. از خط P به خط d_1 عمود است.

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$$d_1: y - x = 1$$

$$d_2: y - x = 0$$

$$\left. \begin{array}{l} d_1: y - x = 1 \\ d_2: y - x = 0 \end{array} \right\} \text{فاصله دو خط} = \frac{|c - c'|}{\sqrt{1^2 + (-1)^2}} = \frac{1}{\sqrt{2}}$$

$$یک ضلع = \frac{1}{\sqrt{2}}$$

$$\text{قطر} = a$$

$$\left\{ \left(\frac{1}{\sqrt{2}} \right)^2 + w^2 = a^2 \rightarrow w^2 = a^2 - \frac{1}{2} \rightarrow w = \sqrt{a^2 - \frac{1}{2}} = \frac{\sqrt{4a^2 - 1}}{2} \right.$$

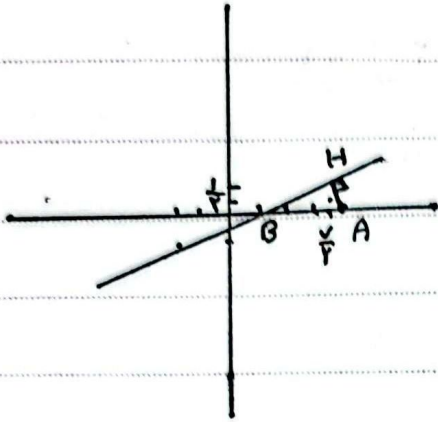
$$\text{مساحت} = \frac{1}{\sqrt{2}} \times \frac{\sqrt{4a^2 - 1}}{2} = \frac{\sqrt{4a^2 - 1}}{2\sqrt{2}} = \boxed{\frac{\sqrt{4a^2 - 1}}{2\sqrt{2}}}$$

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$$x - 3y = 1$$

$$\frac{x}{1} - \frac{3y}{1} = 1$$

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ضلعی n برابر فاصلہ کی A تا خط
 است صان ضلع قائم است. زیرا مساحت
 Max است.

$$AH = \frac{|x - 3y - 1|}{\sqrt{10}} = \frac{|4 - 3(1) - 1|}{\sqrt{10}} = \frac{0}{\sqrt{10}} = 0$$

$$AB^2 = BH^2 + AH^2$$

$$L \rightarrow AB \rightarrow \text{برفورد } y=0 \rightarrow x - 3(0) = 1 \rightarrow x = 1 \rightarrow AB = 4 - 1 = 3$$

$$9 = BH^2 + \frac{9}{10} \rightarrow BH^2 = \frac{81}{10} \rightarrow BH = \frac{9}{\sqrt{10}}$$

$$15 \quad \text{مساحت} = \frac{AH \times BH}{2} = \frac{\frac{0}{\sqrt{10}} \times \frac{9}{\sqrt{10}}}{2} = \frac{0}{2} = 0$$

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پیدا آسانی

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$$\left(-\frac{1}{3}, a\right), \left(-\frac{1}{3}, b\right)$$

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$$m = \frac{b-a}{-\frac{1}{3}-(-\frac{1}{3})} = \frac{b-a}{\frac{1}{3}} \rightarrow \frac{4b-4a}{1} = \sqrt{3} \rightarrow b-a = \frac{\sqrt{3}}{4}$$

$$\text{طول ضلع مربع} = \sqrt{\left(-\frac{1}{3}-(-\frac{1}{3})\right)^2 + (b-a)^2} \rightarrow \sqrt{\left(\frac{1}{3}\right)^2 + \left(\frac{\sqrt{3}}{4}\right)^2} = \sqrt{\frac{1}{36} + \frac{3}{16}} =$$

$$10 \quad \sqrt{\frac{1}{36} + \frac{3}{16}} = \frac{2}{9} = \frac{1}{3}$$

$$(h) \quad \text{طول قطر مربع} = \sqrt{\left(\frac{1}{3}\right)^2 + \left(\frac{1}{3}\right)^2} = h^2 \rightarrow \frac{2}{9} = h^2 \rightarrow h = \frac{\sqrt{2}}{3}$$

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خط از مرکز دایره که به نقطه ی $(-3, -4)$ می رسد به خط مماس L عمود است.

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$$\text{شیب شعاع } OT_1 = \frac{-4-0}{-3-0} = \frac{-4}{-3} = \frac{4}{3}$$

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شیب خط مماس $L \leftarrow OT_1 \perp L$

$$m_L = -\frac{1}{m_{OT_1}} = -\frac{1}{\frac{4}{3}} = -\frac{3}{4}$$

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معادله خط L : $T_1(-3, -4)$

$$y - (-4) = -\frac{3}{4}(x - (-3))$$

$$y + 4 = -\frac{3}{4}(x + 3) \rightarrow 4y + 16 = -3x - 9$$

$$L: 3x + 4y = -25$$

خط L' به خط L عمود ←

$$m_{L'} = -\frac{1}{m_L} = -\frac{1}{-\frac{3}{4}} = \frac{4}{3}$$

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خط L' نیز مماس است ← OT_2 بر آن عمود است

$$m_{OT_2} = m_{L'} = -\frac{3}{4}$$

$T_2(x_2, y_2)$ روی دایره است و از مرکز عبور می کند.

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$$\frac{y_2}{x_2} = -\frac{3}{4} \Rightarrow y_2 = -\frac{3}{4}x_2$$

$$y_2 = -\frac{3}{4}(-4) = 3 \leftarrow x_2 = -4$$

$$r = 5, OT_1 \perp OT_2$$

$T_2(-4, 3)$ قابل قبول

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معادله خط L' مماس در $T_2(-4, 3)$ و شیب $\frac{4}{3}$:

$$y - 3 = \frac{4}{3}(x - (-4)) \rightarrow 3y - 9 = 4x + 16 \rightarrow L': 4x - 3y = -25$$

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$$L: (3x + 4y - 20) \times 3$$

$$L': (4x - 3y - 20) \times 4$$

$$9x + 12y - 60$$

$$16x - 12y - 80$$

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$$(9x + 16x) + 12y - 12y = -60 + (-80)$$

$$25x = -140 \rightarrow x_p = \frac{-140}{25} = -\frac{28}{5}$$

$$3(-\frac{28}{5}) + 4y - 20 \rightarrow -\frac{84}{5} + 4y - 20 \rightarrow 4y = -\frac{84}{5} + 20 \rightarrow$$

$$y_p = -\frac{1}{5}$$

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$$(-1) \times (-5) = 5$$

← 5

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