

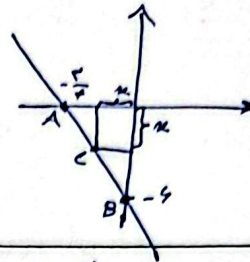
$$AB = \sqrt{(-\frac{r}{\sqrt{2}})^2 + (-\frac{r}{\sqrt{2}})^2} = \sqrt{\frac{r^2 x^2 + 1}{16}} = \sqrt{\frac{r^2 (x^2 + 1)}{16}} = \frac{r}{\sqrt{2}} \sqrt{x^2 + 1}$$

$$AC = \sqrt{x^2 + (\frac{r}{\sqrt{2}} - x)^2} = \sqrt{x^2 + \frac{r^2}{2} + x^2 - \frac{r}{\sqrt{2}} x} = \sqrt{2x^2 + \frac{r^2}{2} - \frac{r}{\sqrt{2}} x}$$

$$BC = \sqrt{x^2 + (x - \frac{r}{\sqrt{2}})^2} = \sqrt{x^2 + x^2 - \frac{r}{\sqrt{2}} x + \frac{r^2}{2}} = \sqrt{2x^2 - \frac{r}{\sqrt{2}} x + \frac{r^2}{2}}$$

$$\overline{AC} + \overline{BC} = \overline{AB}$$

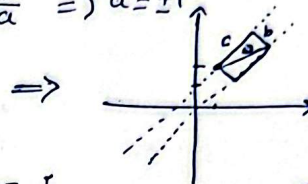
$$\sqrt{2x^2 + \frac{r^2}{2} - \frac{r}{\sqrt{2}} x} + \sqrt{2x^2 - \frac{r}{\sqrt{2}} x + \frac{r^2}{2}} = \frac{r}{\sqrt{2}} \sqrt{x^2 + 1}$$



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$$y = ax + 1 \quad y = \frac{x}{a} + \frac{a-1}{a} \Rightarrow a = a' \Rightarrow a = \frac{1}{a} \Rightarrow a = \pm 1$$

$$a \begin{cases} a = 1 \Rightarrow y = x + 1, y = x \cdot \cos \\ a = -1 \Rightarrow y = -x + 1, y = -x + 1 \end{cases} \quad \text{(نقطه (0,1) صدق می‌کند)}$$

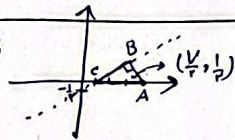


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$$b = \frac{|c - c'|}{\sqrt{a^2 + b^2}} = \frac{|1 - 0|}{\sqrt{1 + (-1)^2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} \quad b^2 + c^2 = \Delta^2 \quad (\frac{\sqrt{2}}{2})^2 + c^2 = 1 \quad c = \sqrt{1 - \frac{1}{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$S_{\text{مستطیل}} = bc = \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = \frac{1}{2}$$

$$\text{فاصله نقطه A از این خط} = \frac{|1 - 0 - 1|}{\sqrt{1^2 + (-1)^2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} = AB$$



$$AB, m: a_{AB} = -\frac{1}{a_{CB}} = -2$$

$$y - 0 = -2(x - 1) \Rightarrow y = -2x + 2$$

$$0 = \frac{x}{2} - \frac{1}{2} \Rightarrow x = 1 \Rightarrow C(1, 0)$$

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$$S_{\Delta} = \frac{1}{2} AB \times CB = \frac{1}{2} \times \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = \frac{1}{4}$$

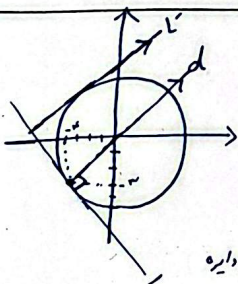
$$CB = \sqrt{r^2 - (\frac{r}{\sqrt{2}})^2} = \sqrt{\frac{r^2 - r^2}{2}} = \frac{r}{\sqrt{2}}$$

$$a = \frac{b - a}{-\frac{1}{2} - (-\frac{1}{2})} = \frac{b - a}{\frac{1}{2}} = \sqrt{2} \Rightarrow b - a = \frac{\sqrt{2}}{2}$$

$$\text{طول وتر مربع} = \sqrt{(b - a)^2 + (-\frac{1}{2} - (-\frac{1}{2}))^2} = \sqrt{(\frac{\sqrt{2}}{2})^2 + (\frac{1}{2})^2} = \sqrt{\frac{2}{4} + \frac{1}{4}} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$$

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$$\text{طول قطر مربع} = \sqrt{2} \times \text{طول وتر مربع} = \sqrt{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{6}}{2}$$



$$a_d = a_{L'} = -\frac{1}{a_L} \Rightarrow a_d = \frac{0 - (-1)}{0 - (-1)} = \frac{1}{1} = 1, \quad a_L = \frac{1}{a_d} = -\frac{1}{1} = -1$$

$$L = \text{مستقیمه: } y - (-1) = -\frac{1}{1}(x - (-1)) \Rightarrow y = -x - 1$$

$$L' = \text{مستقیمه: } y = \frac{1}{1}x + b = x + \frac{1}{2} \Rightarrow \frac{1}{1}x + \frac{1}{2} = -x - 1 \Rightarrow x = -\frac{3}{2} \Rightarrow y = -\frac{1}{2}(-\frac{3}{2}) - \frac{1}{2} = 1 \Rightarrow xy = -\frac{3}{2}$$

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$$\text{فاصله مرکز از خط} = \sqrt{r^2 + r^2} = \Delta$$

$$\Delta = \frac{|c - c'|}{\sqrt{a^2 + b^2}} = \frac{|b|}{\sqrt{(\frac{1}{2})^2 + 1}} = \frac{|b|}{\frac{\sqrt{5}}{2}} \Rightarrow |b| = \frac{2\Delta}{\sqrt{5}} \Rightarrow b = \frac{2\Delta}{\sqrt{5}}$$

له طبق شکل در ناحیه دوم بدون L مقدار مثبت قابل قبول است.

$$a_{AB} = -\frac{1}{r} = \frac{m-k}{4-(-2)} \Rightarrow m-k = -3$$

$$AB = \sqrt{(m-k)^2 + (4-(-2))^2} = \sqrt{(-3)^2 + 4^2} = \sqrt{25} = 5$$

$$S_{\triangle ABC} = AB \times AC = (5) \times (4) = 20$$

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$$a_{AB} = a_{DC} \Rightarrow \frac{4-1}{-1-3} = \frac{y+3}{-1-x-3} \quad \frac{3}{-4} = \frac{y+3}{-1-x-3} \quad -1-2x = -4 \quad x = \frac{3}{2} \Rightarrow C(\frac{3}{2}, y)$$

$$a_{BC} = -\frac{1}{a_{AB}} = \frac{4}{3} = \frac{y-1}{\frac{3}{2}-3} = \frac{y-1}{-\frac{3}{2}} \Rightarrow -4 = 3y-3 \Rightarrow y = -1$$

$$\Rightarrow A(-1, 4) / B(2, 1) / C(\frac{3}{2}, -1) / D(-\frac{5}{2}, 2) \quad AB = \sqrt{(4-1)^2 + (-1-2)^2} = \sqrt{3^2 + 4^2} = 5$$

$$BC = \sqrt{(1-(-1))^2 + (2-\frac{3}{2})^2} = \sqrt{4 + \frac{1}{4}} = \sqrt{\frac{17}{4}} = \frac{\sqrt{17}}{2} \Rightarrow \text{مساحت مستطیل} = 2 \times AB + 2 \times BC = 2 \times 5 + 2 \times \frac{\sqrt{17}}{2} = 10 + \sqrt{17}$$

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$$\alpha = \tan \theta = \sqrt{3} = \frac{-2m}{m^2-1} \quad y = \frac{-2m}{m^2-1} + \frac{3}{m^2-1}$$

$$\sqrt{3} m^2 - \sqrt{3} = -2m$$

$$\sqrt{3} m^2 + 2m - \sqrt{3} = 0 \quad |\alpha - \beta| = \frac{\sqrt{\Delta}}{|\alpha|} = \frac{\sqrt{3^2 - 4(\sqrt{3})(-\sqrt{3})}}{\sqrt{3}} = \frac{\sqrt{12}}{\sqrt{3}} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

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$$BC \text{ خط } BC: a_{BC} = \frac{11-3}{4-2} = 4 \Rightarrow y-3 = 4(x-2) \Rightarrow y = 4x-5 \Rightarrow y-4x+3=0$$

$$AH = \text{فاصله نقطه A از خط BC} = \frac{|4-4+3|}{\sqrt{1^2+(-4)^2}} = \frac{3}{\sqrt{17}} = \frac{3\sqrt{17}}{17}$$

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$$B \text{ خط } BC: y = \frac{3}{4}x - \frac{17}{4} \quad AB: y = -2x+7 \quad AC: 4y-3x-17=0$$

$$\frac{3}{4}x - \frac{17}{4} = -2x+7$$

$$\frac{11}{4}x = \frac{17}{4} + \frac{14}{4}$$

$$\frac{11}{4}x = \frac{31}{4}$$

$$BH = \frac{|4-9-17|}{\sqrt{4^2+(-3)^2}} = \frac{22}{5}$$

$$x=3 \Rightarrow y = -2(3)+7=1 \Rightarrow B(3,1)$$

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