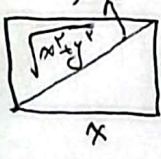


$$\frac{x}{y} = \frac{a}{c} \Rightarrow x = \frac{a}{c}y$$
$$\frac{x+a}{y} = \frac{1+\sqrt{a}}{2} \Rightarrow x+a = \frac{1+\sqrt{a}}{2}y$$
$$S = x \cdot y$$

$$\frac{\frac{x \cdot y}{\frac{a}{c}y}}{\frac{a}{c}y} = \frac{\frac{1+\sqrt{a}}{2}y \times y}{\frac{a}{c}y \times y} \Rightarrow \frac{c}{a} = \frac{1+\sqrt{a}}{2}$$
$$\frac{2(1+\sqrt{a})}{a} \Rightarrow \boxed{0,4(1+\sqrt{a})}$$

1

$$\frac{\sqrt{x^2+y^2}}{x} = \frac{1+\sqrt{a}}{2} \Rightarrow \sqrt{x^2+y^2} = \frac{1+\sqrt{a}}{2}x \Rightarrow x^2+y^2 = \frac{1+\sqrt{a}}{2}x^2$$
$$y^2 = \left(\frac{1+\sqrt{a}}{2} - 1\right)x^2 \Rightarrow \frac{y^2}{x^2} = \frac{1+\sqrt{a}}{2} - 1 \Rightarrow \frac{y}{x} = \frac{1}{1+\sqrt{a}}$$
$$\frac{2}{1+\sqrt{a}} = \frac{\sqrt{a}-1}{2}$$



2

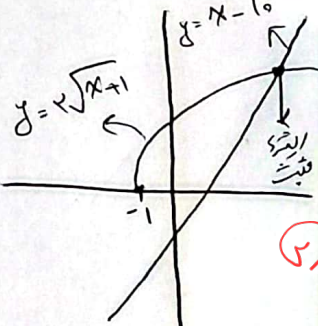
$$\sqrt{ka^2+ca} = c - ca \Rightarrow ka^2+ca = c^2+ca^2-12a \Rightarrow 7a^2-12a+c=0$$
$$\Delta = 144 - 112 = 32 \rightarrow a = \frac{12 \pm \sqrt{32}}{14} = \frac{6 \pm \sqrt{2}}{7}$$
$$\frac{a+1}{a} \begin{cases} a=2 \rightarrow \frac{3}{2} = (1,5) \\ a=\frac{2}{5} \rightarrow \frac{7}{5} = (1,4) \end{cases}$$

$1-ka \geq 0 \Rightarrow a \leq \frac{1}{k}$

3

$$\frac{\sqrt{x+1}(c-\sqrt{x-1}-\sqrt{x-1}-c)}{c^2-(x-1)} = \sqrt{x-1}$$
$$\frac{-2\sqrt{x-1}\sqrt{x+1}}{10-x} = \sqrt{x-1} \Rightarrow 2\sqrt{x+1} = 10-x$$

یک رابطه شیب دارند.



4

$$\frac{2-\sqrt{2-x}-\sqrt{2-x}-2}{c-2+x} \Rightarrow \frac{-2\sqrt{2-x}}{2+x} = \frac{2-x}{2\sqrt{2-x}} = -10(\sqrt{2-x})(\sqrt{2-x}) =$$
$$-10(2-x) = (2+x)(2-x) \Rightarrow -10 = 4+x \Rightarrow \boxed{x = -14}$$

ریشه مثبت ندارد.

5

$$\frac{1}{x^2} + \frac{1}{(1-x)^2} = \frac{14}{9} \Rightarrow \left(\frac{1}{x} + \frac{1}{1-x}\right)^2 - 2\left(\frac{1}{x(1-x)}\right) = \frac{14}{9} \Rightarrow \left(\frac{1}{x(1-x)}\right)^2 = \frac{14}{9}$$

$$t^2 - 2t = \frac{14}{9} \Rightarrow (t-1)^2 = \frac{149}{9} \Rightarrow \begin{cases} t-1 = \frac{\sqrt{149}}{3} \Rightarrow t = \frac{1+\sqrt{149}}{3} \\ t-1 = -\frac{\sqrt{149}}{3} \Rightarrow t = \frac{1-\sqrt{149}}{3} \end{cases}$$

$$\frac{1}{x(1-x)} = \frac{\sqrt{149}}{3} \Rightarrow -x^2 + x - \frac{\sqrt{149}}{3} = 0 \Rightarrow \begin{cases} s_1 = 1 \\ s_2 = 1 \end{cases} \Rightarrow \begin{cases} s_1 + s_2 = 2 \end{cases}$$

$$x+x \geq 0 \Rightarrow x \geq -2 \quad (1)$$

$$-x^2 + 4x - 1 \geq 0 \Rightarrow (x-2)(x-1) \leq 0 \Rightarrow \begin{cases} 1 \leq x \leq 2 \end{cases}$$

$$x \leq 2 \quad (2)$$

$$-x^2 + 4x - 1 \geq 0 \Rightarrow (x-2)(x-1) \leq 0$$

$$-x^2(x-1) + 4x(x-1) \geq 0$$

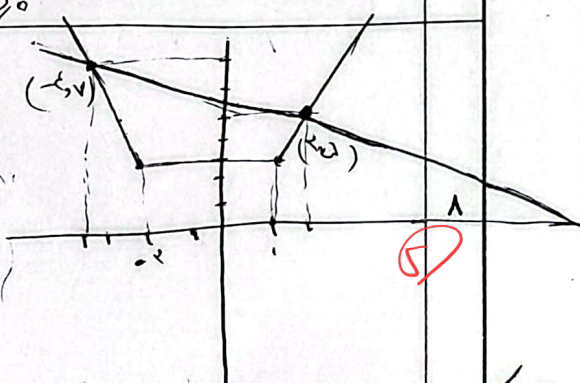
$$(x-1)(4x-x^2) \geq 0 \Rightarrow (x-1)(4-x)(x) \geq 0$$

$$y = \frac{14-x}{x^2}$$

$$y = |x-2| + |x-1|$$

$$2x+1 = \frac{14-x}{x^2} \Rightarrow 4x+x^2 = 14-x \Rightarrow x=2, y=2$$

$$-2x-1 = \frac{14-x}{x^2} \Rightarrow -4x-x^2 = 14-x \Rightarrow x=-2, y=2$$



$$y = \sqrt{(x-2)^2} \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2 \Rightarrow y = |x-2|$$

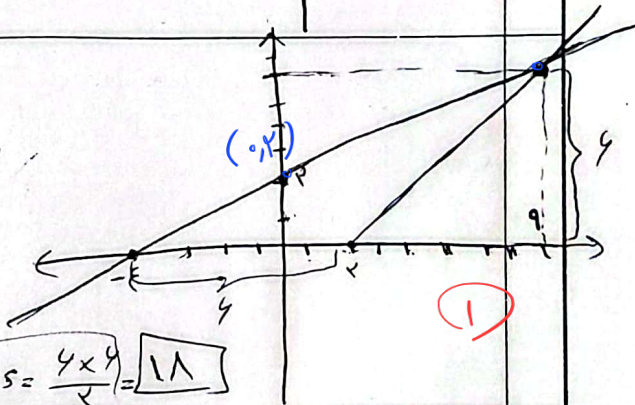
$$y = \frac{1}{2}x + 2$$

$$|x-2| = \frac{1}{2}x + 2 \Rightarrow$$

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

$$\frac{1}{2}x + 2 = 2 - x \Rightarrow x = 0, y = 2$$

$$S = \frac{4 \times 4}{2} = 16$$



$$\frac{1}{x} + \frac{1}{x+9} = \frac{1}{x_0} \Rightarrow \frac{x+9+x}{(x)(x+9)} = \frac{1}{x_0} \Rightarrow$$

$$\frac{(2x+9)}{(x)(x+9)} = \frac{1}{x_0} \Rightarrow x_0(x+11) = x^2 + 9x$$

$$x^2 - 2x - 11 = 0 \Rightarrow (x-4)(x+3) = 0 \Rightarrow x = 4 \quad (1)$$

$$|x-2| = \frac{1}{2}x + 2$$

$$A(0, 2) B(4, 4) C(4, 0)$$

$$AB = \sqrt{16} = 4$$

$$S = \frac{4 \times 4}{2} = 16$$