

$$\frac{L}{w} \text{ (بار)} = \frac{L}{\frac{L}{r}} = \frac{1+\sqrt{5}}{2} \Rightarrow L = r + r\sqrt{5} \rightarrow \frac{S'}{S} = \frac{r(1+\sqrt{5}) \times 4}{5 \times 4} = \frac{r + r\sqrt{5}}{5}$$

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$$L \rightarrow \text{طول} \quad w \rightarrow \text{عرض} \quad - \quad \text{تعداد} = \sqrt{L^2 + w^2}$$

$$\frac{\sqrt{L^2 + w^2}}{L} = \frac{1+\sqrt{5}}{2} \Rightarrow \sqrt{L^2 + w^2} = \frac{L(1+\sqrt{5})}{2} \rightarrow L^2 + w^2 = \frac{L^2(1+\sqrt{5})^2}{4} = \frac{L^2(1+2\sqrt{5}+5)}{4} = \frac{L^2(6+2\sqrt{5})}{4} = \frac{L^2(3+\sqrt{5})}{2}$$

$$\Rightarrow w^2 = \frac{L^2(3+\sqrt{5})}{2} - L^2 = \frac{L^2(1+\sqrt{5})}{2} \rightarrow \frac{w^2}{L^2} = \frac{1+\sqrt{5}}{2} \Rightarrow \left(\frac{w}{L}\right)^2 = \frac{1+\sqrt{5}}{2} \Rightarrow \frac{w}{L} = \sqrt{\frac{1+\sqrt{5}}{2}}$$

$$\Rightarrow \left(\frac{L}{w}\right)^2 = \frac{2}{1+\sqrt{5}} = \frac{\sqrt{5}-1}{2}$$

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$$\sqrt{12a^2 + 4a} = r - 12a \Rightarrow 12a^2 + 4a = (r - 12a)^2 = r^2 - 24ar + 144a^2$$

$$\Rightarrow 12a^2 - 24ar + 144a^2 - 4a = 0 \Rightarrow 156a^2 - 24ar - 4a = 0 \Rightarrow a^2 - 14a + 21 = 0 = (a-14)(a-3) \Rightarrow a = \frac{14}{3} = r, \frac{r}{3}$$

قوت $\rightarrow \frac{r}{3}$ ، در معادله صدق نمی‌کنند قوت $\rightarrow r$

$$\frac{a+1}{a} = \frac{\frac{r}{3} + \frac{r}{3}}{\frac{r}{3}} = \frac{\frac{2r}{3}}{\frac{r}{3}} = \frac{2}{1}$$

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$$\sqrt{x+1} \left(\frac{r - \sqrt{x-1} - (\sqrt{x+1} + 3)}{1 - (x-1)} \right) = \sqrt{x+1} \left(\frac{-r - \sqrt{x-1}}{2-x} \right) = \frac{-(x-1)(\sqrt{x-1})}{x-1} \Rightarrow -r\sqrt{x+1} = 10 - x$$

$$\rightarrow r - \sqrt{x-1} \neq 0 \rightarrow x \neq 10, \sqrt{x-1} \neq 0 \rightarrow x \neq 1$$

$$\rightarrow * : 4x+4 = 100 + x^2 - 6x \rightarrow x^2 - 10x + 94 = 0 \rightarrow \Delta = 100 - 376 = -276 \Rightarrow x = \frac{10 \pm \sqrt{-276}}{2} = 5 \pm \sqrt{-69}$$

خارجی $* : -r\sqrt{x+1} = 10 - x \rightarrow 10 - x \leq 0 \Rightarrow x \geq 10 \Rightarrow 12 \pm \sqrt{12}$

$$\Rightarrow x = 12 + \sqrt{12} \rightarrow \text{یک جواب مثبت}$$

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$$\frac{r - \sqrt{r-x} - (\sqrt{r-x} + 2)}{r - (r-x)} = \frac{-r - \sqrt{r-x}}{x} = \frac{(r-x)(\sqrt{r-x})}{x(r-x)} \Rightarrow r+x = -10 \rightarrow x = -12$$

$$r-x > 0 \rightarrow x < r \rightarrow x = -12 \quad \text{قوت}$$

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ریشه‌ی مثبت ندارد.

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

$$\rightarrow x-x^2=t \rightarrow \frac{1-2t}{t^2} = \frac{14}{9} \Rightarrow 9-14t = 14t^2 \rightarrow 14t^2+14t-9=0 \rightarrow t^2+14t-9(140)$$

$$= (t+14)(t-9) \Rightarrow t = \frac{-14}{140} = \frac{-1}{10}, t = \frac{9}{140} = \frac{9}{14}$$

$$\begin{cases} x-x^2 = \frac{-1}{10} \rightarrow x^2-x-\frac{1}{10}=0 \rightarrow \Delta > 0 \\ x-x^2 = \frac{9}{14} \rightarrow x^2-x+\frac{9}{14}=0 \rightarrow \Delta < 0 \end{cases} \rightarrow \begin{cases} \text{مجموع ریشه ها} = 1 \\ \text{ضرب ریشه ها} = -\frac{1}{10} \end{cases}$$

$$-x^2+4x-1 \geq 0 \Rightarrow x^2-4x+1 \leq 0 \Rightarrow (x-2)(x-2) \leq 0 \rightarrow x \in [2, 2]$$

$$-x^2+6x^2+20x-100 = -x^2(x-2)+20(x-2) = (x-2)(20-x^2) = (x-2)(5-x)(5+x)$$

$$(x-2)(5-x)(5+x) \geq 0 \Rightarrow \frac{-5 \quad 2 \quad 5}{+ \quad - \quad +} \Rightarrow x \in (-\infty, -5] \cup [2, 5]$$

$$\text{مجموع درجه ها} \rightarrow \text{همه درجه ها} \Rightarrow 2+2 \geq 0 \Rightarrow 2 \geq -2 \rightarrow x \in [-2, +\infty) \Rightarrow$$

$$\text{اشتراک دو مجموعه} \rightarrow \{2\} \rightarrow \sqrt{5} + \sqrt{(2)^2} = 2+5=7 = x+2=7 \rightarrow \text{مجموع ریشه ها} \rightarrow \text{تعداد جواب: (1)}$$

$$x > 1 \rightarrow x+2+x-1 = 2x+1 = y \rightarrow 2y = 9x+2 \Rightarrow 4x+2 = 10-x \rightarrow 5x = 8 \rightarrow x = \frac{8}{5} \rightarrow y = \frac{18}{5} = 3.6 \quad A(2, 5)$$

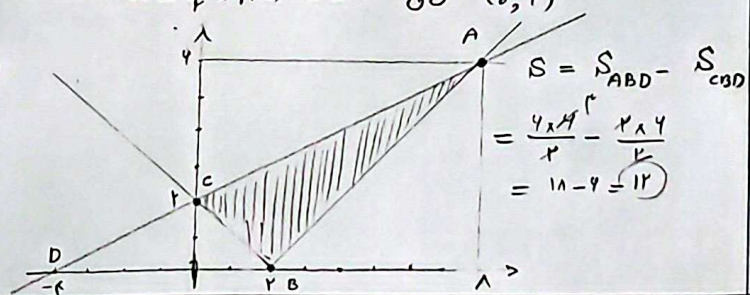
$$-2 \leq x \leq 1 \rightarrow x+2+1-x = 3 = y \rightarrow 2y = 9 \rightarrow 4 = 10-x \rightarrow x = 6 \quad \text{غیر ممکن}$$

$$x < -2 \rightarrow -2-x+1-x = -2x-1 = y \rightarrow 2y = -4x-2 = 10-x \rightarrow -2 = 5x \rightarrow x = -\frac{2}{5} \rightarrow y = \frac{14}{5} = 2.8 \quad B(-\frac{2}{5}, 2.8)$$

$$AB = \sqrt{(4)^2 + (2)^2} = \sqrt{16+4} = \sqrt{20} = 2\sqrt{5}$$

$$y = \sqrt{x^2-4x+4} = \sqrt{(x-2)^2} = |x-2| < \begin{cases} x > 2 \rightarrow x-2 = \frac{1}{2}x+2 \rightarrow \frac{1}{2}x = 4 \rightarrow x = 8 \quad \text{ق ق } (8, 4) \\ x < 2 \rightarrow 2-x = \frac{1}{2}x+2 \rightarrow x = 0 \quad \text{ق ق } (0, 2) \end{cases}$$

در نقطه (2, 0) محور را قطع می کند
مجدد در (0, 0) را قطع می کند
مجدد در (8, 0) را قطع می کند



$$\text{درجه ها: } \frac{1}{x} \rightarrow \text{درجه ها: } \frac{1}{x+9}$$

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

$$\rightarrow 2x^2+18 = x^2+9x \rightarrow x^2-3x-18 = (x-6)(x+3) = 0 \rightarrow x = 6 \quad \text{مجموع}$$