

|                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| $\frac{\sqrt{a}+1}{2} \leq \frac{a+1}{4} \Rightarrow 10+12 \leq \sqrt{a}+1 \Rightarrow 22 \leq \sqrt{a} \Rightarrow a \leq 2\sqrt{a}-3$ $a+2\sqrt{a}-3 \leq 2+2\sqrt{a} \Rightarrow S_{جدید} : 2(2+\sqrt{a}) \leq 1+8\sqrt{a}$ $\frac{S_{جدید}}{S_{قدیم}} \leq \frac{1+8\sqrt{a}}{2} \leq \frac{2+2\sqrt{a}}{1}$                                                                                                                                             | ۱ |
| $\frac{\sqrt{a}+1}{2} \leq \frac{c}{a} \quad 2c \leq a\sqrt{a}+a$ $c \leq \frac{a\sqrt{a}+a}{2} \quad \frac{\sqrt{a^2+b^2}}{a} \leq \frac{\sqrt{a}+1}{2} \xrightarrow{2 \text{ طرف } a} \frac{a^2+b^2}{a^2} \leq \frac{2+2\sqrt{a}}{2}$ $\Rightarrow 1+\frac{b^2}{a^2} \leq \frac{2+\sqrt{a}}{2} \quad \frac{b^2}{a^2} \leq \frac{4\sqrt{a}}{2} \Rightarrow \frac{a^2}{b^2} \leq \frac{2}{1+\sqrt{a}}$                                                       | ۲ |
| $\sqrt{2a^2+5a} = 2-2a \rightarrow 2a^2+5a = 4-8a+4a^2 \rightarrow 2a^2-13a+4=0$ $\rightarrow 2a^2-13a+4=0 \rightarrow (a-2)(a-1/2) \Rightarrow a = \frac{2}{1} \vee a = \frac{1}{2} = 2 \times 0.5$ $\frac{a+1}{a} \leq \frac{9}{2} \leq \frac{9}{2} \leq 5, 11$                                                                                                                                                                                            | ۳ |
| $\frac{\sqrt{x+1}}{\sqrt{x-1}+2} - \frac{\sqrt{x+1}}{2-\sqrt{x-1}} \leq \frac{x-1}{\sqrt{x+1}} \quad \sqrt{x-1} \leq t$ $\sqrt{x+1} \left( \frac{1}{t+2} - \frac{1}{2-t} \right) \leq \sqrt{t^2+2} \times \frac{-2t}{9-t^2} \Rightarrow \frac{-2t\sqrt{t^2+2}}{9-t^2} \leq t$ $2\sqrt{t^2+2} \leq t^2-9 \quad (y+2) \leq (y-9)^2$ $0 \leq t^2 \quad t^2 \geq 9 \quad y^2-22y+14 \leq 0 \Rightarrow y = 11 \pm 4\sqrt{3} \rightarrow \boxed{\text{اربع شیب}}$ | ۴ |
| $\sqrt{2-x} \leq t \quad \frac{1}{t+2} - \frac{1}{2-t} \leq \frac{2-x}{4t} \rightarrow 1+t-4t^2-1+t-4t^2 \leq 1+t^2$ $-6t^2 \leq 1-2t^2-4x+4t^2 \Rightarrow -1+t^2-1 \leq x(t^2-4t^2) \xrightarrow{t^2 \geq 2-x}$ $-14+14x-1 \leq 14x-24 \Rightarrow x^2-10x-24 \leq 0 \rightarrow (x+2)(x-12) \leq 0$ $x = -12, x = 2 \times 0.5$                                                                                                                           | ۵ |

$$9(x-1)^2 + 9x^2 = 140x^2(x-1)^2 \rightarrow 9x^2 - 18x + 9 + 9x^2 = 140x^2(x-1)^2$$

$$18x^2 - 18x + 9 = (4x^2 - 12x + 140x^2) \rightarrow 140x^2 - 12x + 18x^2 + 18x - 9 = 0$$

$$S = \frac{-b}{2a} = \frac{12}{280} = \frac{3}{70}$$

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$$-x^2 + 4x^2 + 20x - 100 \geq 0 \rightarrow x^2 - 4x^2 - 20x + 100 \leq 0 \Rightarrow 4 \leq x \leq 10 \quad (I)$$

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

$$I \cap II \Rightarrow x \leq 2 \quad \sqrt{4} + \sqrt{14} = 2 + 2 \leq 4$$

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$$\sqrt{(x+1)^2 + (y-1)^2} = \sqrt{40} = 2\sqrt{10} \quad (x+1)(x-1) \leq 2(x+1) \rightarrow 2(x+1) + x \leq 14$$

$$4x + 2 + x = 14 \Rightarrow 5x = 12 \rightarrow x = \frac{12}{5} \rightarrow (2, 4)$$

$$-2 \leq x \leq 1 \Rightarrow y = (x+1) + (1-x) = 2 \rightarrow 2 + x = 14 \Rightarrow x = 12 \quad \times$$

$$x \leq -2 \rightarrow y = -(x+1) + (1-x) = -2x \Rightarrow 2(-2x-1) + x \leq 14 \Rightarrow x \leq -4$$

$$y = -2(-4) = 8 \Rightarrow (-4, 8)$$

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$$[x-2] \rightarrow x \geq 2 \rightarrow \frac{1}{x} x + 2 = x - 2 \Rightarrow x \leq 1$$

$$x < 2 \rightarrow \frac{1}{x} x + 2 \leq 2 - x \Rightarrow x \leq 0$$

$$\frac{x+4}{x} \times 1 \leq 4 \times 1 \leq 22 \quad (I)$$

$$(2 \times 2 \times \frac{1}{x}) + (4 \times 4 \times \frac{1}{x}) \leq 2 + 18 \leq 20 \quad (II)$$

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$$II - I \leq 22 - 2 \leq 18$$

$$\frac{1}{B} + \frac{1}{F} = \frac{1}{r} \Rightarrow \frac{1}{B} + \frac{1}{B+9} = \frac{1}{r} \Rightarrow \frac{r(B+9)}{B^2+9B} = \frac{1}{r}$$

$$\Rightarrow r(B+18) \leq B^2+9B \Rightarrow B^2 - rB - 18r \leq 0$$

$$B \leq \frac{r(1+r)}{2} \Rightarrow \frac{r(1+r)}{2} \leq 18$$

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