

$$\frac{x}{4} = \frac{1+\sqrt{5}}{2} \Rightarrow 2x = 2 + 2\sqrt{5} \Rightarrow x = 1 + \sqrt{5}$$

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$$\frac{s'}{s} = \frac{4 \times 2(1+\sqrt{5})}{4 \times 5} = \frac{2+2\sqrt{5}}{5} \quad \checkmark$$

$$\frac{d}{L} = \frac{1+\sqrt{5}}{2} \Rightarrow \frac{\sqrt{L^2+W^2}}{L} = \frac{1+\sqrt{5}}{2} \xrightarrow{\text{تواند}} 1 + \left(\frac{W}{L}\right)^2 = \left(\frac{1+\sqrt{5}}{2}\right)^2$$

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۲

$$\left(\frac{W}{L}\right)^2 = \frac{1+2\sqrt{5}+5}{4} - 1 = \frac{3+\sqrt{5}}{2} - 1 = \frac{1+\sqrt{5}}{2}$$

$$\left(\frac{L}{W}\right)^2 = \frac{1}{\frac{1+\sqrt{5}}{2}} \Rightarrow \frac{2}{1+\sqrt{5}} \times \frac{1-\sqrt{5}}{1-\sqrt{5}} = \frac{\sqrt{5}-1}{2} \quad \checkmark$$

$$2a + \sqrt{2a^2 + 4a} = 2 \Rightarrow 2a - 2 = -\sqrt{2a^2 + 4a} \xrightarrow{\text{تواند}} 4a^2 - 12a + 4 = 2a^2 + 4a$$

(۲)

۳

$$2a^2 - 16a + 4 = 0 \Rightarrow \frac{14 \pm 12}{14} = a \rightarrow 2 \rightarrow 4 + \sqrt{1+1} \neq 2 \quad \text{غیر قابل قبول}$$

$$\frac{4}{14} \rightarrow \sqrt{\quad} \rightarrow \frac{\frac{4}{14} + 1}{\frac{4}{14}} = \frac{11}{4} = \frac{9}{4} \quad \checkmark$$

$$\frac{a}{b+3} - \frac{a}{3-b} = b \Rightarrow \frac{a(3-b) - a(b+3)}{(b+3)(3-b)} = \frac{-2ab}{(b+3)(3-b)} = \frac{-2ab}{10-2} = b$$

(۲)

۴

$$\frac{-2a}{10-2} = 1 \Rightarrow -2a = 10-2 \Rightarrow 2\sqrt{x+1} = x-10$$

$$4(x+1) = (x-10)^2 \Rightarrow x^2 - 24x + 96 = 0 \Rightarrow x = 12 \pm 4\sqrt{3}$$

$$\Rightarrow 12 + 4\sqrt{3} \quad \checkmark$$

$$2-x \geq 0 \Rightarrow 0 < x \leq 2 \quad \text{و} \quad x \neq 2 \Rightarrow 0 < x < 2$$

$$t = \sqrt{2-x} \Rightarrow \frac{1}{t+3} - \frac{1}{2-t} = \frac{t}{5} \Rightarrow \frac{-2t-1}{(t+3)(2-t)} = \frac{t}{5}$$

(۲)

۵

$$t(t+3)(2-t) = -10t-5 \Rightarrow t^3 + t^2 - 14t - 5 = 0$$

$$t \in (0, \sqrt{2}] \Rightarrow 2t^2 \leq 2 \Rightarrow t^3 = t \times t^2 \Rightarrow t^3 < 2t$$

$$\Rightarrow t^3 + t^2 - 14t - 5 < (2t + 2) - 14t - 5 \Rightarrow \underbrace{-12t - 3}_{\text{همواره منفی و متناهی و متناهی}} \quad \checkmark$$

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

$$-140x^4 + 140x^3 - 140x^2 + 140x + 9 = 0 \Rightarrow 140x^4 - 140x^3 + 140x^2 + 140x - 9 = 0$$

$$\text{بسیار} \rightarrow \text{مجموع یسرها} = -\frac{b}{a} \Rightarrow -\frac{140}{140} = -1 \quad \checkmark$$

(2)

$$-x^3 + 14x^2 + 140x - 100 = -(x-5)(x-4)(x+1) \geq 0 \quad \begin{array}{c} -5 \quad 4 \quad 1 \\ + \quad - \quad + \end{array}$$

$$\Rightarrow x \in (-\infty, -1] \cup [4, 5] \quad (1)$$

$$-x^2 + 4x - 1 = -(x-2)(x-4) \quad \begin{array}{c} 2 \quad 4 \\ - \quad + \end{array} \Rightarrow x \in [2, 4] \quad (2)$$

$$(1) \cap (2) \rightarrow x=4 \rightarrow \sqrt{4+0} + \sqrt{4^2+0} = \sqrt{4} + \sqrt{16} \Rightarrow 4=4 \quad \checkmark$$

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(2)

7

$$3y+x=14 \Rightarrow y = \frac{14-x}{3} \Rightarrow |x+2| + |x-1| = \frac{14-x}{3}$$

$$1 \rightarrow x < -2 \Rightarrow -(x+2) - (x-1) = \frac{14-x}{3} \Rightarrow -4x-1 = 14-x \Rightarrow -3x=15 \Rightarrow x=-5$$

$$-5x=15 \Rightarrow x=-3 \text{ بازه نیست} \Rightarrow \frac{14+3}{3} = 7 = y \rightarrow (-3, 7) \quad (1)$$

$$2 \rightarrow -2 \leq x < 1 \Rightarrow x+2 - (x-1) = \frac{14-x}{3} \Rightarrow 3 = 14-x \Rightarrow x=11 \times \text{بازه نیست}$$

$$3 \rightarrow x \geq 1 \Rightarrow 4x+3 = 14-x \Rightarrow x=2 \Rightarrow \frac{14-2}{3} = 4 \Rightarrow (2, 4) \quad (2)$$

$$(1) \cap (2) \rightarrow \sqrt{(2+2)^2 + (4-7)^2} = \sqrt{36+9} = \sqrt{45} = 3\sqrt{5} \quad \checkmark$$

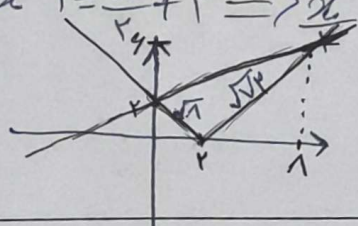
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8

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

$$1 \rightarrow x < 2 \rightarrow 2-x = \frac{x}{2} + 2 \Rightarrow x=0, y=2 \rightarrow (0, 2) \quad (1)$$

$$2 \rightarrow x > 2 \rightarrow x-2 = \frac{x}{2} + 2 \Rightarrow \frac{x}{2} = 4 \Rightarrow x=8, y=8-2=6 \rightarrow (8, 6) \quad (2)$$



$$S = \frac{\sqrt{2^2} \times \sqrt{6^2}}{2} = \frac{1 \times \sqrt{2} \times \sqrt{6}}{2} = \frac{1 \times \sqrt{12}}{2} = \sqrt{3} \quad \checkmark$$

(2)

$$\frac{1}{x} + \frac{1}{x+9} = \frac{1}{20} \Rightarrow 20x + 180 + 20x = x^2 + 9x \Rightarrow x^2 - 31x - 180 = 0$$

$$\Rightarrow \frac{31 \pm \sqrt{31^2 + 4 \times 180}}{2} = \frac{31 \pm 41}{2} = 36 \text{ و } -5$$

36 قابل قبول است

(2)

10