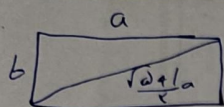


از این مسئله استفاده می‌کنیم

(1)

$$\begin{aligned} S_2 &= L_2 \times W \\ S_1 &= L_1 \times W \end{aligned} \Rightarrow \frac{S_2}{S_1} = \frac{L_2 \times W}{L_1 \times W} = \frac{\frac{1+\sqrt{5}}{2} W}{\frac{5}{2} W} = \frac{2+\sqrt{5}}{5} = \frac{2+\sqrt{5}}{5}$$



$$\begin{aligned} a^2 + b^2 &= \frac{5+2\sqrt{5}}{2} a^2 \Rightarrow b^2 = \frac{2+\sqrt{5}}{2} a^2 \Rightarrow \frac{a^2}{b^2} = \frac{2}{2+\sqrt{5}} = \frac{2}{2+\sqrt{5}} \cdot \frac{2-\sqrt{5}}{2-\sqrt{5}} \\ &= \frac{2\sqrt{5}-2}{-5-4} = \frac{\sqrt{5}-1}{5} \end{aligned}$$

(2)

$$2a-2 = -\sqrt{2a^2+5a} \Rightarrow 4a^2-4a+5 = 2a^2+5a \Rightarrow 2a^2-9a+5=0$$

(3)

$$a^2-9a+5 = (a-1)(a-5) = 0 \Rightarrow a = \frac{5 \pm \sqrt{15}}{2} \text{ or } a = 1$$

$$a=2 \Rightarrow 5 = -5 \text{ (ممنوع)} \quad a = \frac{5}{2} \Rightarrow -\frac{1}{2} = -\frac{1}{2} \checkmark \Rightarrow \frac{a+1}{a} = \frac{\frac{5}{2}+1}{\frac{5}{2}} = \frac{7}{5} = 1.4$$

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

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

$$= \sqrt{2+1} \left(\frac{-2\sqrt{2-1}}{1} \right) = \sqrt{2-1} \Rightarrow -2\sqrt{2+1} = 10-2 \Rightarrow 2+5=2^2-2+100$$

$$\Rightarrow 2^2-2+5=0 \Rightarrow 2 = \frac{2 \pm \sqrt{14}}{2} \Rightarrow 2 = 1 \pm \sqrt{14}$$

(4) (5)

$$\frac{1}{\sqrt{2-2+2}} + \frac{1}{\sqrt{2-2-2}} = \frac{2-2}{2\sqrt{2-2}} \xrightarrow{f=2\sqrt{2-2}} \frac{1}{f+2} + \frac{1}{f-2} = \frac{f}{2f}$$

-A

$$\xrightarrow{f \neq 0} \frac{f-2+f+2}{f^2-4} = \frac{f}{2} \Rightarrow \frac{f}{f^2-4} = \frac{f}{2} \Rightarrow \frac{2}{f^2-4} = \frac{1}{2} \Rightarrow f^2-4=4$$

$$\Rightarrow f = \pm \sqrt{8} \Rightarrow f = \sqrt{8} = 2\sqrt{2} \Rightarrow 2 = -11 \xrightarrow{2=0} \text{معادله بی‌نتیجه}$$

$$\frac{1}{2^x} + \frac{1}{(1-x)^x} = \frac{190}{9} \Rightarrow \frac{(1-x)^x + 1^x}{2^x(1-x)^x} = \frac{190}{9} \Rightarrow \frac{1^x - 2^x + 1}{2^x(2-1)^x} = \frac{190}{9}$$

$$\Rightarrow \frac{1(2^x-2)+1}{(2^x-2)^x} = \frac{190}{9} \stackrel{2^x-2=t}{\Rightarrow} \frac{1t+1}{t^x} = \frac{190}{9} \Rightarrow \frac{t^x+t+1}{t^x} = \frac{191}{9}$$

$$\Rightarrow \left(\frac{t+1}{t}\right)^x = \left(\frac{191}{9}\right)^x \Rightarrow \frac{t+1}{t} = \frac{191}{9} \Rightarrow \frac{1}{t} = \frac{190}{9} \Rightarrow t = \frac{9}{190}$$

$$\Rightarrow \frac{t+1}{t} = \frac{191}{9} \Rightarrow \frac{1}{t} = \frac{190}{9} \Rightarrow \frac{1}{t} = \frac{190}{9} \Rightarrow t = \frac{9}{190}$$

$$\Rightarrow 2^x - 2 = \frac{9}{190} \Rightarrow 2^x - 2 - \frac{9}{190} = 0 \stackrel{\Delta > 0}{\Rightarrow} \zeta = -\frac{b}{a} = 1$$

$$\Rightarrow 2^x - 2 = -\frac{9}{190} \Rightarrow 2^x - 2 + \frac{9}{190} = 0 \stackrel{\Delta > 0}{\Rightarrow} \zeta = -\frac{b}{a} = 1$$

معادله $2^x - 2 = 0$

$$\sqrt{2 + \sqrt{-2^x + 2^x + 2^x - 100}} + \sqrt{2^x + \sqrt{-2^x + 2^x - 1}} \geq 2 + 1^x$$

$$-2^x + 2^x + 2^x - 100 \geq 0$$

$$2^x(2-2) - 100 \geq 0$$

$$(2^x - 100)(2-2) \geq 0 \Rightarrow (2^x - 100)(2-2)(2-2) \geq 0$$

$$-2^x + 2^x - 1 \geq 0$$

$$\Rightarrow 2^x - 2^x - 1 \leq 0$$

$$(2-2)(2-2) \leq 0$$

$$\frac{x}{b-b^2}$$

$$[1, 2] \text{ (II)}$$

-a	x	a
a	-	a
a	-	a
a	-	a

$$I \cap II \Rightarrow \{x\}$$

$$(-\infty, -a] \cup [a, \infty) \text{ (I)}$$

$$2^x = 4 \Rightarrow \sqrt{4} + \sqrt{16} = 4 + 4$$

$$\Rightarrow 4 + 4 = 8 \checkmark$$

حل المسألة

$$y = |2+x| + |x-1| \Rightarrow \begin{cases} y = 2x+1 & x \geq 1 \\ y = 2 & -1 \leq x \leq 1 \\ y = -2x-1 & x \leq -1 \end{cases}$$

$$xy + 2 = 16 \Rightarrow y = -\frac{1}{x}x + \frac{16}{x}$$

$$x \geq 1 \Rightarrow 1 \leq 2x+1 \leq -\frac{1}{x} + \frac{16}{x} \Rightarrow 4x+1 \leq -x+16 \Rightarrow 5x \leq 15 \Rightarrow x \leq 3 \Rightarrow 1 \leq x \leq 3 \Rightarrow y = 2$$

$$-1 \leq x \leq 1 \Rightarrow y = -\frac{1}{x}x + \frac{16}{x} \Rightarrow -x+16 = 4 \Rightarrow x = 1 \Rightarrow y = 2$$

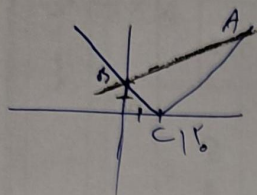
$$x \leq -1 \Rightarrow -y-1 = -\frac{1}{x}x + \frac{16}{x} \Rightarrow -y-1 = -x+16 \Rightarrow -y = 17-x \Rightarrow y = x-17 \Rightarrow x = -1 \Rightarrow y = -18$$

$$y = 2 \Rightarrow A \left| \frac{1}{x} \right|, B \left| \frac{-1}{x} \right| \Rightarrow AB = \sqrt{4^2 + (-1)^2} = \sqrt{17} = \sqrt{10}$$

$$g = \sqrt{2^2 - 4 - 5} = \sqrt{(2-1)^2} = |2-1| \Rightarrow \begin{cases} x-2 & 2 \geq 1 \\ -x+2 & 2 < 1 \end{cases}$$

(9)

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



$$2 \geq 1 \Rightarrow 2-2 = \frac{1}{x} x + 2 \Rightarrow \frac{1}{x} x = 0 \Rightarrow x = 1 \quad \begin{matrix} y=2-2 \\ y=2 \end{matrix}$$

$$2 < 1 \Rightarrow -2+2 = \frac{1}{x} x + 2 \Rightarrow -2 = \frac{1}{x} x \Rightarrow x = 0 \quad \begin{matrix} y=2 \\ y=2 \end{matrix}$$

$$A|_x \quad B|_y$$

$$BC: g = -x+2 \Rightarrow y+x-2=0$$

$$AH = \frac{|4+1-2|}{\sqrt{2}} = \frac{3}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$$

$$BC = \sqrt{1^2 + (-1)^2} = \sqrt{2} = \sqrt{2}$$

$$S = \frac{AH \cdot BC}{2} = \frac{\frac{3\sqrt{2}}{2} \times \sqrt{2}}{2} = \frac{3}{2}$$

$$\frac{1}{x} + \frac{1}{x+9} = \frac{1}{x_0} \Rightarrow \frac{x+9}{x^2+9x} = \frac{1}{x_0} \Rightarrow x^2+9x = 60x+110$$

(10)

$$\Rightarrow x^2-51x-110=0 \Rightarrow (x-54)(x+2)=0 \Rightarrow \underbrace{x=54}_{\substack{\text{rech.} \\ \text{Erl.}}} \quad \underbrace{x=-2}_{\text{GGE}}$$

rech. = irr.

Erl. = 60