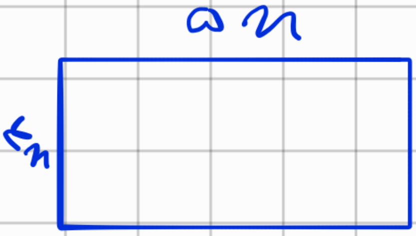
[illegible] ←

۱ ←

$$\frac{l}{w} = \frac{\sqrt{5}+1}{2}$$



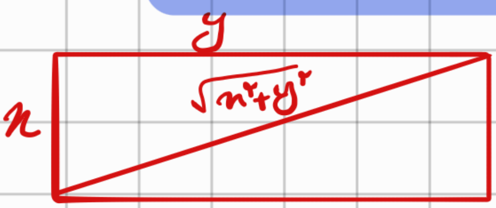
$$\rightarrow S = 20x^2$$

$$\rightarrow \frac{l}{2 \times 4x} = \frac{\sqrt{5}+1}{2} \rightarrow$$

$$l = 4x(\sqrt{5}+1) \longrightarrow S = 4x \times 4x(\sqrt{5}+1)$$

$$\frac{4x \times 4x(\sqrt{5}+1)}{4x \times 5x} = 0.8(\sqrt{5}+1)$$

۲ ←



$$\rightarrow \frac{\sqrt{x^2+y^2}}{y}$$

$$y^2/x^2 = ?$$

$$\frac{\sqrt{x^2+y^2}}{y} = \frac{\sqrt{5}+1}{2} \xrightarrow{2} \frac{x^2+y^2}{y^2} = \frac{6+2\sqrt{5}}{4}$$

$$\longrightarrow 2x^2+2y^2 = 3y^2 + y^2\sqrt{5} \longrightarrow 2x^2 = y^2 + y^2\sqrt{5}$$

$$\longrightarrow x^2 = y^2\frac{(1+\sqrt{5})}{2} \longrightarrow \frac{y^2}{x^2} = \frac{\sqrt{5}-1}{2}$$

۳

$$3a + \sqrt{2a^2 + 4a} = 2$$

$$\sqrt{2a^2 + 4a} = 2 - 3a \xrightarrow{\text{به توان}}$$

$$2a^2 + 4a = 9a^2 + 4 - 12a \longrightarrow$$

$$7a^2 + 4 - 16a = 0 \longrightarrow \Delta = 144$$

$$a = \frac{16 \pm 12}{14} \longrightarrow a = 2,\ \frac{2}{7} \longrightarrow a = 2/7$$

(× ، ✓)

$$\frac{\frac{2}{7} + \frac{3}{7}\ \frac{a}{3}}{\frac{2}{7}} = a/2 = 1/2\,a$$

۴

$$\frac{\sqrt{x+1}}{\sqrt{x-1}+3} - \frac{\sqrt{x+1}}{3-\sqrt{x-1}} = \frac{x-1}{\sqrt{x-1}}$$

$$\hookrightarrow \frac{3\sqrt{x+1} - \sqrt{x^2-1} - \sqrt{x^2-1} - 3\sqrt{x+1}}{9 - (x-1)} \qquad \frac{10-x}{}$$

$$\sqrt{x+1} \times \sqrt{x-1}$$

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

$x > 1 \leftarrow x-1 > 0$ — $n-1$ مزدوج

$-2\sqrt{x+1} = 10-x$ $\rightarrow x > 10$

$\rightarrow 4(x+1) = x^2 + 100 - 20x \rightarrow$

$4x+4$

$x^2 - 24x + 96 = 0 \rightarrow \Delta = 144\sqrt{3}$

$x = \frac{24 \pm 8\sqrt{3}}{2} = 12 \pm 4\sqrt{3} \rightarrow 12+4\sqrt{3}$

این جواب قابل قبول چون $x \geq 10$ هست؟

$$\frac{1}{\sqrt{2-x}+2} - \frac{1}{2-\sqrt{2-x}} = \frac{2-x}{3\sqrt{2-x}} \leftarrow 3$$

$\sqrt{2-x} = t$

$$\rightarrow \frac{1}{t+2} - \frac{1}{2-t} = \frac{2-t-t-2}{4-t^2} = \frac{-2t}{4-t^2}$$

$$\frac{2-x}{3\sqrt{2-x}} = \frac{t^2}{3t} = \frac{t}{3}$$

$$\frac{-2t}{4-t^2} = \frac{t}{3} \rightarrow -10 = 4-t^2 \rightarrow$$

$t^2 \rightarrow 2-x$

$-10 = x+2 \rightarrow x = -12 \rightarrow$ این جواب پذیرفته نیست

$$\frac{1}{x^2}+\frac{1}{(1-x)^2}=\frac{145}{9}$$

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

$$\frac{1}{(\frac{1}{2}+t)^2}+\frac{1}{(\frac{1}{2}-t)^2}=\frac{145}{9}$$

$$\frac{\frac{1}{4}+t^2-t+\frac{1}{4}+t^2+t}{(\frac{1}{4}-t^2)^2}$$

$$\frac{4(\frac{1}{4}+t^2)}{(\frac{1}{4}-t^2)^2}=\frac{80}{9}\longrightarrow \frac{9}{4}+9t^2=$$

$$(\frac{1}{4}-t^2)^2$$

$$t^4+\frac{1}{16}-\frac{t^2}{2}$$

$$\rightarrow$$

$$36t^4-18t^2+11=0 \longrightarrow \Delta=144$$

$$t^2=a=\frac{18\pm 12}{72}\longrightarrow a=\frac{1}{12},\frac{11}{12}\longrightarrow$$

$$t=\pm\frac{1}{4},\pm\frac{\sqrt{33}}{10}\longrightarrow x=\frac{1}{2}+t\Rightarrow x=\frac{1}{4},\frac{3}{4}$$

$$\frac{1}{2}+\frac{\sqrt{33}}{10},$$

$$\frac{1}{2}-\frac{\sqrt{33}}{10}$$

$$\frac{1}{4}+\frac{3}{4}+(\frac{1}{2}\pm\frac{\sqrt{33}}{10})=2$$

$-x^3+4x^2+25x-100 = -(x^3-4x^2-25x+100)$ ←۷

$= -(x-4)(x^2-25) = -(x-4)(x-5)(x+5) \geq 0$

$(x-4)(x-5)(x+5) \leq 0 \Rightarrow$

-5	4	5
− |	+ |	− | +

$x \in (-\infty, -5] \cup [4, 5]$

$-x^2+9x-8 = -(x-1)(x-8) \geq 0 \longrightarrow$

1	8
+ |	− | +

$(x-1)(x-8) \leq 0 \rightarrow$

$\rightarrow x \in [1, 8]$

اشتراک دو جواب $\longrightarrow ((-\infty, -5] \cup [4, 5]) \cap [1, 8] =$

$\{4\}$

$x=4 \longrightarrow \sqrt{4+\sqrt{0}} + \sqrt{16+\sqrt{0}} = 2+4 = 6$

معادله تنها یک جواب دارد ← $x=4$

$y = |x+1| + |x-1|$ ←۱

$x \geq 1 \rightarrow 2x$

$-1 \leq x \leq 1 \rightarrow 2$

$x \leq -1 \rightarrow -2x$

$y = \frac{17-x}{3}$

$x \le -2 \rightarrow -2x - 1 = \frac{10 - x}{3} \rightarrow$

$-6x - 3 = 10 - x \rightarrow -5x = 13 \rightarrow x = -2.6$

$\rightarrow y = 5$

$A(-2.6, 5)$

$2x + 1 = \frac{10 - x}{3} \rightarrow 6x + 3 = 10 - x \rightarrow 7x = 7 \rightarrow$

$x = 1 \rightarrow$

$y = 3$

$B(1, 3)$

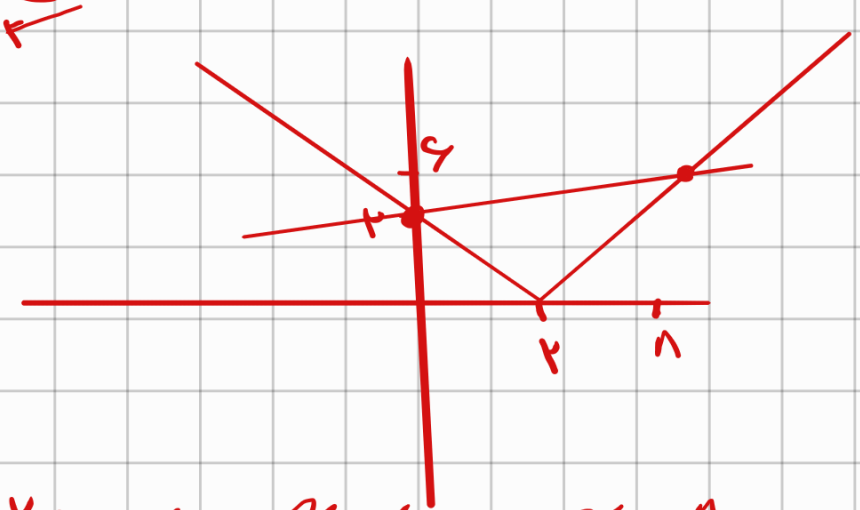
$\overline{AB} = \sqrt{\underbrace{(1 + 2.6)^2 + (3 - 5)^2}_{6.76}}$

$= 2\sqrt{10}$

$y = \sqrt{x^2 - 4x + 4} = |x - 2|$

$\sqrt{(x-2)^2}$

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



$x \ge 2$

$x - 2 = \frac{1}{2}x + 2 \rightarrow 2x - 4 = x + 4 \rightarrow x = 4 \rightarrow$

$y = 2$

$2 - x = \frac{1}{2}x + 2 \rightarrow -2x = x + 4 \rightarrow x = 0, y = 2$

$$\begin{vmatrix} 2 & 0 & 1 \\ 0 & 2 & 1 \\ 1 & 4 & 1 \end{vmatrix} \rightarrow \frac{1}{2}\underbrace{(14+12+0-8-0-0)}_{24}$$

$$S_D = \frac{1}{2} \times 24 = 12$$

$$\left.\begin{array}{l} \frac{1}{B}+\frac{1}{F}=\frac{1}{20} \\ B+9=F \end{array}\right\} \rightarrow \frac{1}{B}+\frac{1}{B+9}=\frac{1}{20} \quad \leftarrow b$$

$$\frac{2B}{B(B+9)} = \frac{1}{20} \rightarrow B^2+9B = 40B+180$$

$$\rightarrow B^2-31B-180=0 \rightarrow D=841 \rightarrow$$

$$B = \frac{31 \pm 41}{2} \rightarrow \frac{72}{2} = 36$$