

سوال 1

$$\frac{\text{طول مستطیل}}{\text{عرض مستطیل}} = \frac{5}{4} \quad \text{مساحت مستطیل طلایی} = ?$$

$$\textcircled{1} \frac{L}{w} = \frac{5}{4} \rightarrow L = 5x \rightarrow w = 4x \Rightarrow S_1 = 20x^2$$

$$\frac{S_2}{S_1} = \frac{1(\sqrt{5}+1)x^2}{20x^2} = \frac{2\sqrt{5}+2}{5}$$

$$\textcircled{2} \frac{L}{w} = \frac{\sqrt{5}+1}{2} \rightarrow L = 2(\sqrt{5}+1)x \rightarrow w = 4x \Rightarrow S_2 = 1(\sqrt{5}+1)2x^2$$

مقدار طلایی = $\frac{\text{طول مستطیل}}{\text{عرض مستطیل}}$

$$\left(\frac{\text{طول}}{\text{عرض}}\right)^2 = ?$$

$$y \rightarrow \frac{\sqrt{5}+1}{2}x$$

سوال 2

$$\rightarrow x^2 + y^2 = \left(\frac{\sqrt{5}+1}{2}x\right)^2 \rightarrow y^2 = \frac{1+2\sqrt{5}}{2}x^2 \rightarrow \frac{x^2}{y^2} = \frac{2}{1+\sqrt{5}} = \frac{2(\sqrt{5}-1)}{4} = \frac{\sqrt{5}-1}{2}$$

$$3a + \sqrt{2a^2 + 4a} = 2 \quad \frac{a+1}{a} = ?$$

سوال 3

$$3a + \sqrt{2a^2 + 4a} = 2 \rightarrow \sqrt{2a^2 + 4a} = 2 - 3a \rightarrow 2a^2 + 4a = (2 - 3a)^2 \rightarrow 2a^2 + 4a = 4 - 12a + 9a^2 \rightarrow 7a^2 - 16a + 4 = 0 \rightarrow (7a-2)(a-2) = 0$$

$$\rightarrow \begin{cases} 7a-2=0 \rightarrow a=\frac{2}{7} \\ a-2=0 \rightarrow a=2 \end{cases}$$

$$\frac{a+1}{a} \xrightarrow{a=\frac{2}{7}} \frac{\frac{2}{7}+1}{\frac{2}{7}} = \frac{\frac{9}{7}}{\frac{2}{7}} = \frac{9}{2} = 4.5$$

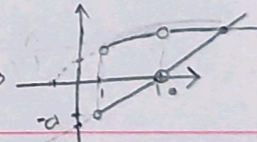
$$\frac{\sqrt{x+1}}{\sqrt{x-1}+3} - \frac{\sqrt{x+1}}{3-\sqrt{x-1}} = \frac{x-1}{\sqrt{x-1}} \rightarrow \sqrt{x+1} \left(\frac{1}{\sqrt{x-1}+3} - \frac{1}{3-\sqrt{x-1}} \right) = \frac{x-1}{\sqrt{x-1}}$$

سوال 4 جعفر شمس نسبت؟

D: x > 1

$$\Rightarrow \frac{1}{\sqrt{x-1}+3} - \frac{1}{3-\sqrt{x-1}} = \frac{\sqrt{x-1}}{\sqrt{x+1}} \rightarrow \frac{3-\sqrt{x-1}-\sqrt{x-1}-3}{9-(x-1)} = \frac{\sqrt{x-1}}{\sqrt{x+1}} \rightarrow \frac{-2\sqrt{x-1}}{10-x} = \frac{\sqrt{x-1}}{\sqrt{x+1}}$$

$$\Rightarrow (x=1 \text{ غلط}) \rightarrow \frac{-2}{10-x} = \frac{1}{\sqrt{x+1}} \xrightarrow{x \neq 0} \sqrt{x+1} = \frac{10-x}{2} \rightarrow \sqrt{x+1} = \frac{10-x}{2}$$



نسبت شمس نسبت 5/9

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

$$2-x > 0 \rightarrow 2 > x$$

سوال 5 جعفر شمس نسبت؟

$$(t = \sqrt{2-x})$$

$$\frac{1}{t+2} - \frac{1}{2-t} = \frac{t}{5t} \rightarrow \frac{2-t-t-2}{4-t^2} = \frac{t}{5} \rightarrow \frac{-2t}{4-t^2} = \frac{t}{5} \rightarrow -10 = 4-t^2 \rightarrow t^2 = 14$$

$$\rightarrow t = \pm\sqrt{14} \rightarrow \sqrt{2-x} = \sqrt{14} \rightarrow 2-x = 14 \rightarrow x = -12 \Rightarrow \text{نسبت ندارد}$$

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

سوال 6

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

$$\rightarrow (10t+3)(14t-3)=0 \rightarrow t = -\frac{3}{10} = x-x^2 \rightarrow x^2-x-\frac{3}{10}=0 \rightarrow p=1$$

$$\rightarrow t = \frac{3}{14} = x-x^2 \rightarrow x^2-x+\frac{3}{14}=0 \rightarrow p=1 \rightarrow \boxed{2}$$

$$\sqrt{x} + \sqrt{-x^3 + 4x^2 + 2\omega x - 100} + \sqrt{x^2 + \sqrt{-x^2 + 4x - 1}} = x + 2$$

$$\begin{aligned} & \downarrow \\ & -x^2(n-4) + 2\omega(n-4) \\ & \rightarrow (n-4)(\omega-n)(4+n) \end{aligned}$$

$$\begin{aligned} & \downarrow \\ & -(x-2)(n-4) \\ & -\frac{1}{2} + \frac{1}{4} - \end{aligned}$$

$$D_1: [2, 4]$$

$$D_2: (-\infty, -\omega] \cup [4, \omega]$$

$$\Rightarrow D_1 \cap D_2 = \{4\}$$

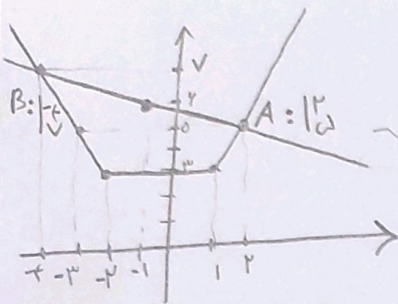
$$\sqrt{4+0} + \sqrt{14+0} \stackrel{?}{=} 4$$

$$2 + 2 = 4 \quad \checkmark$$

$$\Rightarrow \boxed{\{4\}} \text{ یک جواب دارد}$$

$$y = |x+2| + |x-1|, \quad 3y + x = 17$$

$$\hookrightarrow \begin{cases} |x+2| \\ |x-1| \end{cases}$$



$$A: \begin{cases} x+2 = 17-3x \\ x-1 = 17-3x \end{cases} \rightarrow 4x+3 = 17-3x \rightarrow x=2 \rightarrow \begin{cases} 2 \\ 1 \end{cases}$$

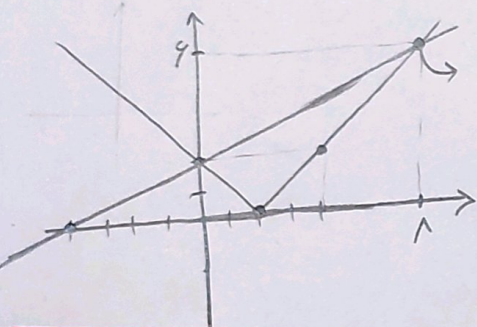
$$B: \begin{cases} -x-2 = 17-3x \\ -x-1 = 17-3x \end{cases} \rightarrow -4x-3 = 17-3x \rightarrow x=-4 \rightarrow \begin{cases} -4 \\ 3 \end{cases}$$

سوال ۸) انداز به پاره خفا $9 = AB$

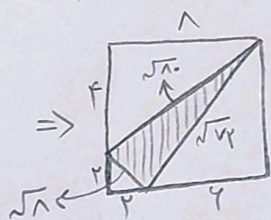
$$2\sqrt{10} = \sqrt{4^2 + 2^2}$$

$$y = \sqrt{x^2 - 4x + 4}, \quad y = \frac{1}{x}x + 2$$

$$\hookrightarrow |x-2|$$



$$\frac{x}{2} + 2 = x - 2 + \frac{x}{2} = 4 \rightarrow x = 8$$



مثلث قائمه است طبق فیثاغورس

$$\Rightarrow S = \frac{\sqrt{12} \times \sqrt{4}}{2} = \boxed{12}$$

$$\text{عبور به تنهایی} = 9 \text{ ساعت} \quad \text{عبور به همراه} = 20 \text{ ساعت} \quad \text{عبور به تنهایی} = ?$$

$$\text{مقدار عبور به تنهایی} = x \quad \text{مقدار عبور به همراه} = 9 + x$$

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

$$180 + 4 \cdot x = 9x + x^2 \rightarrow x^2 - 5x - 180 = 0 \rightarrow (x-34)(x+5) = 0 \rightarrow \begin{cases} x=34 \quad \checkmark \\ x=-5 \quad \times \end{cases}$$

$$\boxed{\text{مقدار عبور به تنهایی} = 34}$$