$$\frac{x}{y} = \frac{5}{4} \qquad \frac{x+t}{y} = \frac{1+\sqrt{5}}{2} \quad (1)$$

$$\frac{\text{مساحة}}{\text{محيط}} = \frac{(x+t)\,y}{2x+2y} \Rightarrow$$

$$\frac{(x+t)\,y}{2x+2y} = \frac{5}{4} \times \frac{1+\sqrt{5}}{2} = 101.5\%$$

$$\frac{z}{x} = \frac{1+\sqrt{5}}{2} \qquad x^2 + y^2 = z^2 \Rightarrow \sqrt{x^2+y^2} = z$$

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

$$\Rightarrow 1 + \frac{y^2}{x^2} = \frac{2(3+\sqrt{5})}{4} \Rightarrow \frac{y^2}{x^2} = 2 + \frac{\sqrt{5}}{2} - \frac{1}{2} =$$

$$\frac{2}{1+\sqrt{5}} = \frac{x^2}{y^2} \quad (= \frac{1+\sqrt{5}}{2}$$

① $\frac{1}{x(1-x)} = \frac{16}{15} \Rightarrow -x^2 + x = \frac{15}{16} \rightarrow \boxed{S_1 = 1}$

② $\Rightarrow \frac{1}{x(1-x)} = -\frac{10}{3} \Rightarrow -x^2 + x = \frac{3}{10} \Rightarrow \boxed{S_2 = 1}$ $\boxed{S_1 + S_2 = 2}$

$$\left(\sqrt{2a^2+3a}\right)^2 = (2-3a)^2$$

$$2a^2 + 3a = 4 + 9a^2 - 12a$$

$$7a^2 - 15a + 4 = 0$$

$$\Delta = 225$$

$$a_1 = \frac{15-15}{2(7)} = 0 \qquad a_2 = \frac{15+15}{2(7)} = \frac{4}{7}$$

(3)

$$\frac{a+1}{a} \to \frac{2+1}{2} = \frac{3}{2}$$

$$\frac{\frac{4}{7}+1}{\frac{4}{7}} = 2.5$$

$$\frac{\sqrt{x+1}}{\sqrt{x-1}+3} - \frac{\sqrt{x+1}}{3-\sqrt{x-1}} = \frac{x-1}{\sqrt{x-1}} \Rightarrow \frac{\sqrt{x+1}\left(3-\sqrt{x-1}-\sqrt{x-1}-3\right)}{3^2-(x-1)}$$

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

$$4x+4 = x^2-20x+100 \Rightarrow x^2-24x+96=0$$

$\Delta > 0$ $\quad S > 0$ $\quad P > 0$ (دارای دو ریشه مثبت است)

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$\sqrt{۲-x} = t \qquad t \geq ۰ \rightarrow \sqrt{۲-x} = \sqrt{۱۶} \rightarrow x = -۱۴$

(تنها جواب)

$$\frac{۱}{۹+۲} = \frac{۱}{۲-t} = \frac{t^{۲}}{\Delta t}$$

$$\frac{-۲\Delta}{-\Delta^{۲}+۶} = \frac{۲}{\Delta t} \rightarrow -t^{۲}+۱۶t^{۲} \overset{t=}{=} ۶ \quad \frac{۲\sqrt{۱۶}}{۲} \text{ غ ق ق} \quad \frac{۲\sqrt{۱۶}}{۲}$$

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

$$\Rightarrow \left(\frac{1}{x(1-x)}\right)^2-2\left(\frac{1}{x(1-x)}\right)=\frac{145}{9} \Rightarrow t^2-2t=\frac{145}{9} \Rightarrow$$

$$t^2-2t+1=\frac{169}{9}$$

$$(t-1)^2=\frac{169}{9}=\begin{cases}\textcircled{1}\ t-1=\frac{13}{3} \rightarrow t=\frac{16}{3}\\ \textcircled{2}\ t-1=\frac{-13}{3} \Rightarrow t=\frac{-10}{30}\end{cases}$$

$$\textcircled{1}\quad \frac{1}{x(1-x)}=\frac{16}{3} \Rightarrow -x^2+x=\frac{3}{16} \rightarrow \boxed{S_1=1}$$

$$\textcircled{2} \Rightarrow \frac{1}{x(1-x)}=-\frac{10}{3} \Rightarrow -x^2+x=-\frac{3}{10} \Rightarrow \boxed{S_2=1} \qquad \boxed{S_1+S_2=2}$$

$\sqrt{x+\sqrt{-x^2+4x^2+24x-16}}+\sqrt{x^2+\sqrt{-x^2+6x-8}}=x+2$ (V

① : $x+2\geq 0 \rightarrow \boxed{x\geq -2}$

② : $-x^2+6x-8\geq 0 \Rightarrow -(x^2-6x+8)\geq 0 \Rightarrow$

$(x-2)(x-4)\leq 0$

③ $-x^2(x-4)+2(x-4)\geq 0$ $(x-4)(2-x^2)\geq 0$

$\boxed{2\leq x<4}$

$\boxed{x\leq -2 \cup 4\leq x\leq 2} \Leftarrow (x-4)(2-x)(2+x)\geq 0$

① ∩ ② ∩ ③ $\rightarrow \boxed{x=4}$ الجواب صحيح

$y=|x+2|+|x-1|$ $3y+x=12 \rightarrow y=\frac{-x+12}{3}$ (A

$y=2x+1$

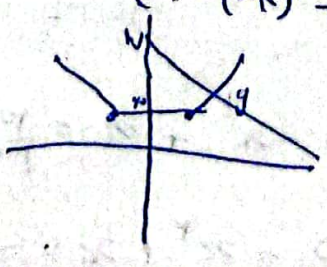
$y=-2x-1$

$\begin{cases} 2x+1=\frac{-x+12}{3} \Rightarrow 6x+3=12-x \\ -2x-1=\frac{-x+12}{3} \Rightarrow -6x-3=-x+12 \end{cases}$

$\boxed{x=2,\ y=5} \rightarrow (2,5)$

$\boxed{y=-1,\ x=-4} \rightarrow (-4,-1)$

AB طول $=\sqrt{(2-(-4))^2+(5-(-1))^2}=\sqrt{72}=6\sqrt{2}$



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

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

$\hookrightarrow y_1 = \sqrt{(x-2)^2} = |x-2|$

$|x-2| = \frac{1}{2}x + 2$

I $x \leq 2 \rightarrow -x+2 =$

$\frac{1}{2}x + 2 \leftarrow$ (مرفوض) $x = 4$

II $x > 2 \rightarrow -(x-2) =$

$\frac{1}{2}x + 2 \rightarrow \frac{1}{2}x = 0 \rightarrow x = 0$

$y = \frac{1}{2}(0) + 2 = 2$ (2,0)

$y = \frac{1}{2}(4) + 2 = 4$ (4,4)

$\frac{|4 - 3 + 7|}{\sqrt{4^2 + 1^2}} = \frac{8}{\sqrt{17}}$

$\frac{1}{2} \times 4\sqrt{17} \times \frac{8}{\sqrt{17}} = 16$

الحل = ب

(۱۰

$20\left(\frac{1}{x}+\frac{1}{y}\right)=1$

$\rightarrow \frac{1}{x}+\frac{1}{y}=\frac{1}{20}$

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

$x=\frac{31\pm\sqrt{31^2+4\times 180}}{2} \Rightarrow x=36$ یا $x=$ غیر قابل قبول

$\Delta=(31)^2-4(1)(-180)$

$x=36$

$x=\frac{-10}{2}=-5$

ساعت ۳۶ ← بهروز

~~ساعت [illegible]~~ ← فرهاد