۱۹/۲۵

به دلیل ننوشتن نام و نام خانوادگی نمره شما ۱۰ می‌باشد

۱)

$\frac{x}{y} = \frac{۵}{۴} \qquad \frac{x+t}{y} = \frac{1+\sqrt{۵}}{۲}$

۲)

$\frac{\text{طول قطر}}{\text{طول ضلع}} = \frac{(x+t)y}{xy} \Rightarrow$

$\frac{(x+t)y}{xy} = \frac{۴}{۵} \times \frac{1+\sqrt{۵}}{۲} = ۰/۴(1+\sqrt{۵})$

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

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

(5)

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

$$\frac{2}{1+\sqrt{5}} = \frac{x^2}{y^2} \qquad \left(= \frac{1+\sqrt{5}}{2}\right.$$

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

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

$S_1 + S_2 = 2$

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۱٫۵

$2 - 3a \geq 0$

$a \leq \frac{2}{3}$

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

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

$7a^2 - 16a + 4 = 0$

$\Delta = 144$

$a_1 = \frac{16 - 12}{2(7)} = \frac{4}{14} = \frac{2}{7}$

$a_2 = \frac{16 + 12}{2(7)}$ ~~$a_2 = \frac{2}{3}$~~

$\frac{a+1}{a} \to \frac{\frac{2}{7} + 1}{\frac{2}{7}}$

$\frac{\frac{2}{7} + \frac{7}{7}}{\frac{2}{7}} = 4{,}5$

۱٫۷۵

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

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

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

$\Delta > 0$ $\quad$ $S > 0$ $\quad$ $P > 0$ (دارای ۲ ریشه مثبت است)

$x \geq 10$ پس $4\sqrt{4}-12$ غیرقابل قبول می‌باشد و تنها ۱ ریشه مثبت دارد

(۵)

$\sqrt{۲-x} = t \qquad t \geq ۰ \rightarrow \sqrt{۲-x} = \sqrt{۱۴} \rightarrow x = -۱۲$

(ریشه + ندارد)

$\frac{۱}{t+۲} = \frac{۱}{۲-t} = \frac{t^۲}{۵t}$

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$\frac{-۲۵}{-۵^۲+۴} = \frac{۲}{۵t} \rightarrow -t^۴ + ۱۴t^۲ = ۰ \rightarrow t = -\frac{۲\sqrt{۱۴}}{۲} \text{ و } \frac{۲\sqrt{۱۴}}{۲}$

غ ق ق

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

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

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

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

(۵)

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

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

$\boxed{S_1+S_2=2}$

$$\sqrt{x+\sqrt{-x^2+6x^2+27x-100}}+\sqrt{x^2+\sqrt{-x^2+4x-3}}=x+2 \quad (1)$$

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

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

$$(x-3)(x-1)\leq 0$$

③ $-x^2(x-1)+27(x-1)\geq 0 \quad (x-1)(27-x^2)\geq 0$

$$\boxed{1\leq x<3\sqrt{3}}$$

$$\boxed{x\leq 0 \cup 1\leq x\leq 3\sqrt{3}} \Leftarrow (x-1)(3\sqrt{3}-x)(3\sqrt{3}+x)\geq 0$$

① ∩ ② ∩ ③ $\rightarrow \boxed{x=1}$ جواب صحیح است

$y=|x+2|+|x-1| \qquad 3y+x=11 \rightarrow y=\frac{-x+11}{3}$ (A)

$$\begin{cases} y=2x+1 \\ y=-2x-1 \end{cases}$$

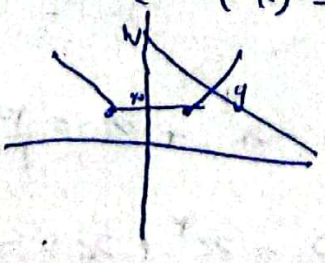
$$\begin{cases} 2x+1=\frac{-x+11}{3} \Rightarrow 6x+3=11-x \\ -2x-1=\frac{-x+11}{3} \end{cases}$$

$\boxed{x=2,\ y=5}$ ← (2,5)

$-6x-3=-x+11 \Rightarrow -5x=14 \Rightarrow x=-\frac{14}{5}$

$\boxed{y=1,\ x=-4}$ ← (-4,1)

$AB=\sqrt{(2-(-4))^2+(5-1)^2}=\sqrt{52}=2\sqrt{13}$



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

$\hookrightarrow y_1 = \sqrt{(x-2)^2} = |x-2|$ $\quad\quad |x-2| = \frac{1}{2}x + 2$

$I \quad x \leq 2 \rightarrow x - 2 = \frac{1}{2}x + 2$

$((8,6)) \quad \boxed{x = 8} \leftarrow$

$y = \frac{1}{2}(8) + 2 = 6$

$II \quad 2 < x \rightarrow -(x-2) = \frac{1}{2}x + 2 \rightarrow -\frac{3}{2}x = 0 \rightarrow \boxed{x = 0}$

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

$\frac{|8 + 6 - 2|}{\sqrt{1^2 + 1^2}} = \boxed{6\sqrt{2}}$

$S = \frac{1}{2} \times 6\sqrt{2} \times \sqrt{8} = 3\sqrt{16} = 12$

جواب $= 12$

(۱۰

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

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

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

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

مقبول نیست

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

$$x=36$$

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

ساعت ۳۶ = بهروز

ساعت ۴۵ = فرهاد