Subject:

Year. Month. Date. ( ) تلاش معنوی ۱۰ ریاضی Name. ۲۰

$$\frac{x'}{2} = \frac{\sqrt{5}+1}{2} \longrightarrow x' = \sqrt{5}+1)$$ — ۱

$$\frac{x'}{x} = \frac{2}{5}(\sqrt{5}+1)$$ ۲

طول اولیه $x = 5$

$$\frac{\sqrt{5}+1}{2} = \frac{\sqrt{a^2+b^2}}{a} \xrightarrow{\text{توان } 2} \frac{3+\sqrt{5}}{2} = \frac{a^2+b^2}{a^2} \longrightarrow \frac{b^2}{a^2} = \frac{1+\sqrt{5}}{2}$$ — ۲

۲

$a =$ طول

$b =$ عرض $\sqrt{a^2+b^2} =$ قطر

$$\left(\frac{a}{b}\right)^2 = \frac{2}{1+\sqrt{5}} = \frac{2(\sqrt{5}-1)}{4} = \boxed{\frac{\sqrt{5}-1}{2}}$$

$$3a-2 = -\sqrt{2a^2+4a} \xrightarrow{\text{توان } 2} 9a^2+4-12a = 2a^2+4a$$ — ۳

۲

$$7a^2-16a+4=0 \xrightarrow{\text{روش}} a^2-16a+28=0 \longrightarrow (a-14)(a-2)=0$$

$$a = \frac{\cancel{14}}{\cancel{2}},\ \frac{2}{7} \xrightarrow{\ I\ } \frac{a=2 \ \text{غ ق ق}}{a=\frac{2}{7} \ \text{ق ق}}$$

$$\frac{a+1}{a} = 1+\frac{1}{a} = 1+\frac{7}{2} = \boxed{4/5}$$

$$3a-2 < 0 \longrightarrow a < \frac{2}{3} \quad I$$

۴

$$\frac{\sqrt{x+1}}{\sqrt{x-1}+3} + \frac{\sqrt{x+1}}{\sqrt{x-1}-3} = \frac{x-1}{\sqrt{x-1}} \xrightarrow{x\neq 1} \frac{\sqrt{x+1}(\sqrt{x-1}-3)+\sqrt{x+1}(\sqrt{x-1}+3)}{x-10} = \sqrt{x-1}$$

۲

$$2\sqrt{x^2-1} = \sqrt{x-1}\,(x-10) \longrightarrow \overbrace{2\sqrt{x+1} = x-10}^{x\geq 10} \longrightarrow x^2-20x+100 = 4x+4$$

$$x^2-24x+96=0 \longrightarrow 2 \text{ ریشه مثبت} \longrightarrow \text{غ ق ق یکی کوچکتر از ۱۰}$$

یک ریشه مثبت

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$x \neq 2 \rightarrow \dfrac{1}{\sqrt{2-x}+2} + \dfrac{1}{\sqrt{2-x}-2} = +\dfrac{1}{5}\sqrt{2-x}$ ۵-

۶

$\dfrac{2\cancel{\sqrt{2-x}}}{\underbrace{2-x-4}_{-x-2}} = \dfrac{1}{5}\cancel{\sqrt{2-x}} \rightarrow 2 = -\dfrac{1}{5}x - \dfrac{2}{5} \longrightarrow \dfrac{12}{5} = -\dfrac{1}{5}x \rightarrow x = -12$

جواب مثبت ندارد.

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$$\left(\frac{1}{x}+\frac{1}{1-x}\right)^2-2\left(\frac{1}{x(1-x)}\right)=\frac{160}{9}$$

$$\to \left(\frac{1}{x-x^2}\right)^2-\frac{2}{x-x^2}=\frac{160}{9}\xrightarrow{\frac{1}{x-x^2}=t} t^2-2t+1=\frac{169}{9}$$

$$\to t=\frac{16}{3} \text{ و } -\frac{10}{3} \quad \begin{cases} -x^2+x-\frac{3}{16}=0 \to S_1=1 \\ -x^2+x+\frac{3}{10}=0 \to S_2=1 \end{cases} \quad \boxed{1+1=2}$$

$$\underbrace{\overbrace{-x^3+4x^2}^{}+25x-100}_{}\geq 0 \qquad \overbrace{}^{4(x^2-25)} \quad \underbrace{}_{-x(x^2-25)}$$

$$-x^3+4x^2+25x-100\geq 0 \longrightarrow (x-5)(x+5)(4-x)\geq 0$$

$-5 \quad 4 \quad 5$

$+ \quad - \quad + \quad -$ $\quad \mathrm{I}$ $\quad -۷$

د

$$-x^2+6x-8\geq 0 \to (x-2)(x-4)\leq 0$$

$2 \quad 4$

$+ \quad - \quad +$ $\longrightarrow \mathrm{II}$

$$\mathrm{I}\cap\mathrm{II}=\{4\}$$

$\cancel{\sqrt{\tfrac{4+0}{2}}}+\cancel{\sqrt{\tfrac{4^2+0}{4}}}=\cancel{\tfrac{4+2}{6}}$ ✓ قق

یک جواب

۸

	-2		1	
$\underbrace{-x-2-x+1}_{-2x-1}$		3		$\underbrace{x+2+x-1}_{2x+1}$

$$\frac{17-x}{3} = -(2x+1) \longrightarrow \left.\begin{matrix} x=-4 \\ y=7 \end{matrix}\right\} B$$

$$\frac{17-x}{3} = 2x+1 \longrightarrow \left.\begin{matrix} x=2 \\ y=5 \end{matrix}\right\} A$$

$$AB = \sqrt{(2+4)^2 + (5-7)^2} = \boxed{2\sqrt{10}}$$

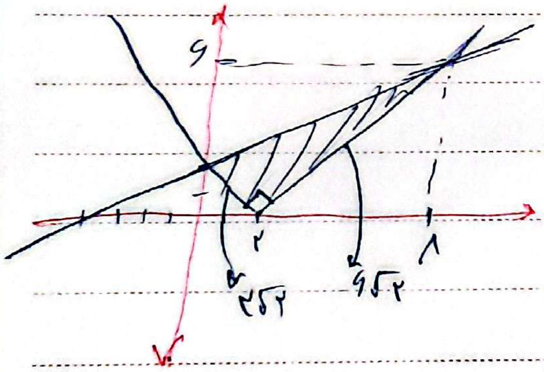
۹ –

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

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

$x \geq 2$ و $x-2 = \frac{1}{2}x+2 \longrightarrow x=8$ $y=6$

$x < 2$ و $-x+2 = \frac{1}{2}x+2 \longrightarrow x=0$ و $y=2$



$$S_\Delta = \frac{1}{2} \times 2\sqrt{2} \times 6\sqrt{2} = \boxed{12}$$

۱۰ –

x مدت زمان بهروز

$x+9$ مدت زمان فرهاد

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

$$x^2 - 31x - 180 = 0 \longrightarrow (x-36)(x+5) = 0 \longrightarrow \boxed{x=36}$$ بهروز در ۳۶ ساعت

$x=-5$ غ ق ق

در ۴۵ ساعت