یکتا بنی‌اری
مقطع: یازدهم دختر A

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①

نسبت طلایی: $\frac{1+\sqrt{5}}{2} \Longrightarrow \frac{\frac{1+\sqrt{5}}{2}}{\frac{5}{4}} = \frac{1+\sqrt{5}}{2/5} \to 0/4 + 0/4\sqrt{5}$

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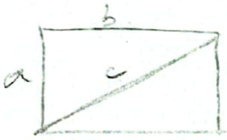
②



$\frac{c}{b} = \frac{\sqrt{5}+1}{2} \to 2c = (\sqrt{5}+1)b$

$c = \frac{(\sqrt{5}+1)}{2}b$

$b^2 + a^2 = c^2$

$b^2 + a^2 = \frac{(\sqrt{5}+1)^2 b^2}{4} \to a^2 = \frac{b^2(6+2\sqrt{5}) - 4b^2}{4} \to a^2 = \frac{b^2(2+2\sqrt{5})}{4}$

$\boxed{\frac{b^2}{a^2} = \frac{4}{2+2\sqrt{5}}} = \frac{2}{1+\sqrt{5}}$

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③

$3a + \sqrt{2a^2+4a} = 2 \to 3a - 2 = -\sqrt{2a^2+4a} \to 9a^2 + 4 - 12a = 2a^2 + 4a$

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

$a^2 - 16a + 28 = 0$

$(a-14)(a-2)$

$\times$ ② $\cancel{\frac{14}{7}}$ $\frac{2}{7}$ ✓

$\frac{a+1}{a} \to 1 + \frac{1}{a} \to 1 + 3/5 \to 4/5$

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④

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

۱ جواب

$(\sqrt{x-1}+3)(3-\sqrt{x-1}) = 10-x \Longrightarrow \sqrt{x+1}\left(\frac{1}{\sqrt{x-1}+3} - \frac{1}{3-\sqrt{x-1}}\right) = \sqrt{x-1}$

$(\sqrt{x+1})\left(\frac{-2\cancel{\sqrt{x-1}}}{10-x}\right) = \cancel{\sqrt{x-1}} \to -2\sqrt{x+1} = 10-x \xrightarrow{2\text{ توان}} 4(x+1) = x^2 - 20x + 100$

$x^2 - 24x + 96 = 0 \to \Delta' = b'^2 - ac \xrightarrow{b' = \frac{b}{2}} \Delta' = (-12)^2 - 96 \to 48$

$x_{1,2} = \frac{-b' \pm \sqrt{\Delta'}}{a} \to x_1 = 12 + 4\sqrt{3}$ ✓ / $x_2 = 12 - 4\sqrt{3}$ ✗

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⑤

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

$(2+\sqrt{2-x})(2-\sqrt{2-x}) \Rightarrow 4-(2-x) \to \boxed{2+x}$

$\frac{-2\cancel{\sqrt{2-x}}}{2+x} = \frac{\cancel{\sqrt{2-x}}}{5} \to -10 = 2+x$

$x = -12$

? جواب مثبت ۰

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$$\frac{1}{x^2}+\frac{1}{(1-x)^2}=\frac{160}{9} \to \frac{x^2+(x^2-2x+1)}{(x(1-x))^2}=\frac{160}{9} \to \frac{2\overbrace{(x^2-x)}^{t}+1}{(x-x^2)^2}=\frac{160}{9}$$

$$\frac{2t+1}{t^2}=\frac{160}{9} \xrightarrow[\text{صورت}]{\text{ترکیب در}} \frac{t^2+2t+1}{t^2}=\frac{169}{9} \to \left(\frac{1+t}{t}\right)^2=\frac{169}{9}$$

$$\frac{1+t}{t}= \begin{cases} -\frac{13}{3} \to t=-\frac{3}{16}=x^2-x \to x^2-x+\frac{3}{16} \Rightarrow \text{جواب } (1) \\ \frac{13}{3} \to t=0/3=x^2-x \to x^2-x-0/3= \Rightarrow \text{جواب } (1) \end{cases}$$

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(۷) تساوی ... [illegible]

$$\sqrt{x+\sqrt{-x^3+4x^2+25x-100}}+\sqrt{x^2+\sqrt{-x^2+6x-8}}=x+2$$

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

II: $-x^3+4x^2+25x-100\geq 0 \to -x^2(x-4)+25(x-4)\geq 0 \to$

$(x-4)(5+x)(5-x)\geq 0$ $\quad$ $-5 \quad 4 \quad 5$: $- \; + \; - \; +$ $\quad$ $4\leq x\leq 5$ یا $x\leq -5$

$I\cap II=4$

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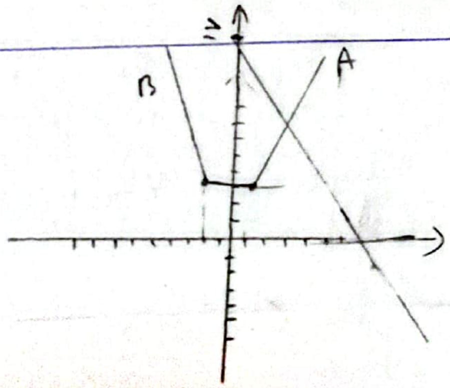
$$y=|x+2|+|x-1|=\begin{cases} x\geq 1: & 2x+1\\ -2\leq x<1: & 3\\ x<-2: & -2x-1\end{cases}$$

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



I: A تقاطع با شاخه ; $2x+1=\frac{17-x}{3}\to A\binom{2}{5}$

II: B ″ ; $-2x-1=\frac{17-x}{3}\to B\binom{-4}{7}$ $\quad$ $AB=\sqrt{\Delta x^2+\Delta y^2}=2\sqrt{10}$

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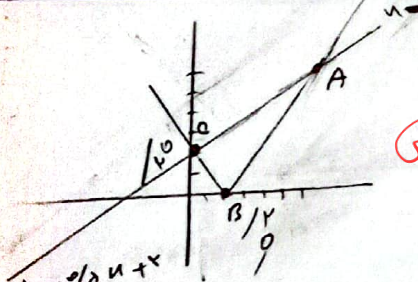
$y=\frac{1}{2}x+2 \qquad y=\sqrt{x^2-4x+4}=\sqrt{(x-2)^2}=|x-2|$

$A\to x-2=0/5x+2\to x=8\to A\binom{8}{6}$

$$S=\frac{1}{2}\left|\begin{matrix}8&6&1\\2&0&1\\0&2&1\end{matrix}\right|=12$$



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$$\frac{1}{x}+\frac{1}{x+9}=\frac{1}{20}\to \frac{2x+9}{x^2+9x}=\frac{1}{20}\to x^2-31x-180\to (x-36)(x+5)$$

$x=36$ ✓ $\quad x=-5$ ✗

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