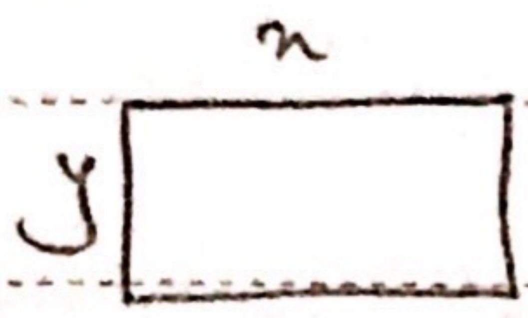
Subject:
Year: Month: Date:

تکلیف شماره ۱۸ — یازدهم دختر A — سارینا شهیدمحمدی

۱-



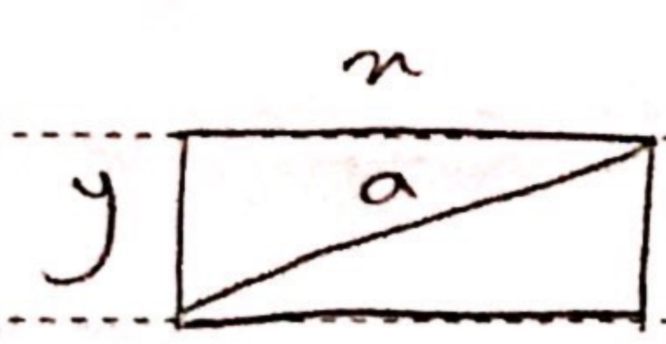
$$\frac{x}{y} = \frac{5}{4} \leadsto \frac{x'}{y} = \frac{1+\sqrt{5}}{2}$$

$$x = \frac{5y}{4} \qquad x' = \frac{1+\sqrt{5}\,y}{2}$$

$$S = \frac{5}{4}y \times y = \frac{5}{4}y^2 \qquad S' = \frac{1+\sqrt{5}\,y}{2} \times y = \frac{1+\sqrt{5}\,y^2}{2}$$

$$\Rightarrow \frac{S'}{S} = \frac{\frac{1+\sqrt{5}\,\cancel{y^2}}{\cancel{2}}}{\frac{5}{\cancel{4}_{2}}\cancel{y^2}} = \frac{2+2\sqrt{5}}{5}$$

۲-



$$a = \sqrt{x^2+y^2}$$

$$\frac{\sqrt{x^2+y^2}}{x} = \frac{1+\sqrt{5}}{2} \xRightarrow{\text{به توان ۲}} \frac{x^2+y^2}{x^2} = \frac{1+5+2\sqrt{5}}{4}$$

$$\Rightarrow 4x^2+4y^2 = x^2+5x^2+2\sqrt{5}\,x^2 \Rightarrow 4y^2 = (2+2\sqrt{5})x^2$$

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

$$\Rightarrow \frac{2}{1+\sqrt{5}} \times \frac{1-\sqrt{5}}{1-\sqrt{5}} = \frac{2-2\sqrt{5}}{-4} = \frac{\sqrt{5}-1}{2}$$

۳-

$$\frac{a+1}{a} = \frac{\frac{2}{7}+\frac{7}{7}}{\frac{2}{7}} = \frac{\frac{9}{\cancel{7}}}{\frac{2}{\cancel{7}}} = \frac{9}{2} = 4/5 \qquad 3a + \sqrt{2a^2+4a} = 2$$

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

$$\xRightarrow{\text{اوس}} a^2-16a+28 = (a-14)(a-2) \overset{=0}{\Rightarrow} a = \frac{14}{7} = 2 \;,\; a = \frac{2}{7}$$

$$a = 2 \Rightarrow 6 + 4 = 2 \Rightarrow \text{غ ق ق} \otimes$$

$$a = \frac{2}{7} \Rightarrow \frac{6}{7} + \sqrt{\frac{8}{49}+\frac{8}{7}} = \frac{14}{7} = 2 \checkmark$$

$$\frac{8}{7}$$

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٤ـ $\frac{\sqrt{x+1}}{\sqrt{x-1}+3} - \frac{\sqrt{x+1}}{3-\sqrt{x-1}} = \frac{x-1}{\sqrt{x-1}} = \sqrt{x-1}$

؟!

$\frac{\cancel{3\sqrt{x+1}} - \sqrt{x^2-1} - \sqrt{x^2-1} - \cancel{3\sqrt{x+1}}}{9-x+1} = \sqrt{x-1}$

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

$\Rightarrow -2\sqrt{x+1} = 10-x \Rightarrow x-2\sqrt{x+1}-10=0$

$x+1-2\underbrace{\sqrt{x+1}}_{t}-11=0$

$t^2-2t-11=0 \Rightarrow t=\frac{2\pm\sqrt{48}}{2}$

$\Rightarrow \Delta = 4-4(1)(-11)=48$

$t=\sqrt{x-1} \Rightarrow t\geq 0 \Rightarrow t=\frac{2+\sqrt{48}}{2}$ ✓

الف) یک جواب

٥ـ $\frac{1}{\sqrt{2-x}+2} - \frac{1}{2-\sqrt{2-x}} = \frac{2-x}{5\sqrt{2-x}}$, $x\neq 2$

$\Downarrow$

$\frac{\cancel{2}-\sqrt{2-x}-\sqrt{2-x}-\cancel{2}}{4-2+x} = \frac{2-\cancel{x}}{5\sqrt{\cancel{2-x}}} \Rightarrow \frac{-2\sqrt{2-x}}{2+x} = \frac{\sqrt{2-x}}{5}$

با توجه به اینکه $x\neq 2$ ، تقسیم بر $\sqrt{2-x}$ $\Rightarrow \frac{-2}{2+x} = \frac{1}{5} \Rightarrow 2+x=-10 \Rightarrow x=-12$

؟! فاقد جواب (+)

$\frac{1}{x^2}+\frac{1}{(1-x)^2}=\frac{160}{9}$ $\qquad \frac{16}{3}-\frac{10}{3}=\frac{6}{3}=2$

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

$t^2-2t=\frac{160}{9} \Rightarrow t^2-2t+1=\frac{160}{9}+1 \Rightarrow t^2-2t+1=\frac{169}{9}$

$(t-1)^2=\frac{169}{9} \Rightarrow t-1=\pm\frac{13}{3}$

$\rightarrow t-1=\frac{13}{3} \Rightarrow t=\frac{16}{3}$

$\rightarrow t-1=-\frac{13}{3} \Rightarrow t=-\frac{10}{3}$

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$$\sqrt{x+\sqrt{-x^3+4x^2+25x-100}}+\sqrt{x^2+\sqrt{-x^2+6x-8}}=x+2 \qquad -7$$

برای بدست آوردن دامنه

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

	2		4	
+		−		+

$x\in[2,4]$ I

$-x^3+4x^2+25x-100\geq 0$

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

$x(25-x^2)+4(x^2-25)\geq 0 \Rightarrow x(25-x^2)-4(25-x^2)\geq 0$

$(25-x^2)(x-4)\geq 0 \Rightarrow$

	−5		4		5	
+		−		+		−

$x\in(-\infty,-5]\cup[4,5]$ II

$I\cap II \Rightarrow x=4$

تنها مورد قابل قبول

$\Rightarrow \sqrt{4+\sqrt{\cancel{-64+64}+100-100}}+\sqrt{16\sqrt{\cancel{-16+24}-8}}=4+2$

$2+4=4+2 \Rightarrow x=4$ فقط این جواب

$y=|x+2|+|x-1| \qquad 3y+x=17 \qquad -8$

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

$\Rightarrow |x+2|+|x-1|=\frac{17-x}{3} \Rightarrow 3|x+2|+3|x-1|+x-17=0$

$x<-2$	$-2<x<1$	$x>1$
$-3x-6-3x+3+x-17=$	$3x+6-3x+3+x-17=$	$3x+6+3x-3+x-17$
$-5x-20$	$x-8$	$7x-14 \Rightarrow x=2$
ق	غ ق	
$x=-4$	$x=8 \Rightarrow 8\notin(-2,1)$	

$7x-14=0$

ق

$x=2$

$A(2,5)$

$B(-4,7)$

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

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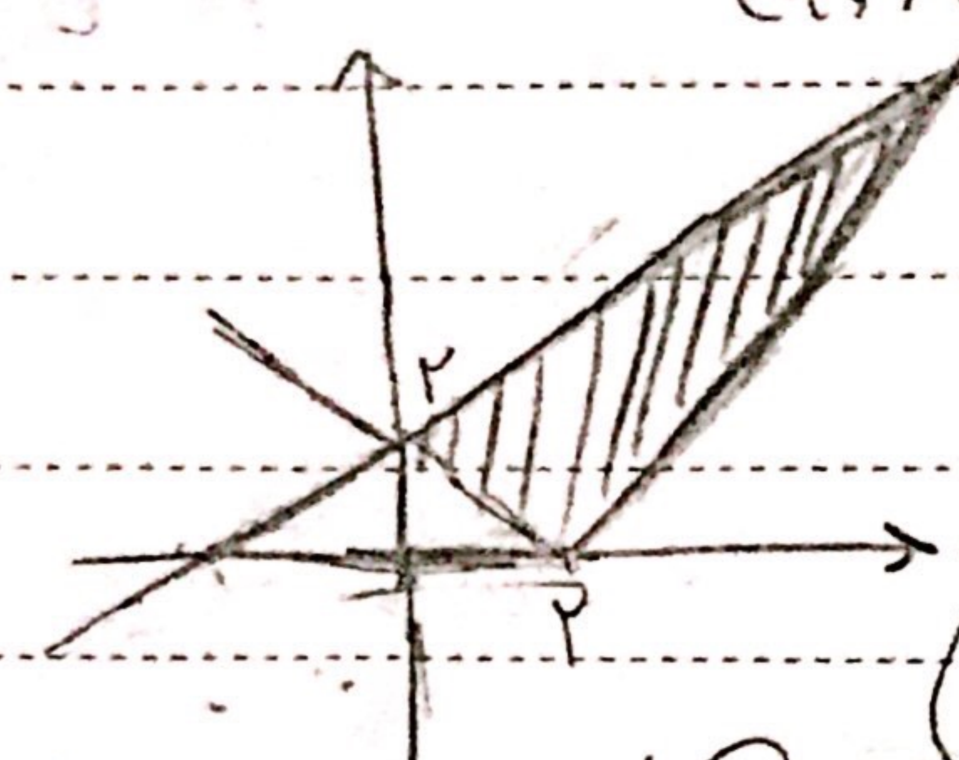
$y = \frac{1}{2}x + 2$ $\qquad y = \sqrt{x^2 - 4x + 4}$

$(8, 6)$ $\quad y = \sqrt{(x-2)^2} = |x-2|$



	2	
	$2-x$	$x-2$

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

$\Leftarrow \{\; 2x - 4 = x + 4 \qquad x = 8$

$\begin{bmatrix} 8 & 2 & 0 \\ 1 & 1 & 1 \\ 6 & 0 & 2 \end{bmatrix}$

$|0 + 4 + 0 - 16 - 12 - 0| = 24 \rightarrow \frac{1}{2} \times 24 = 12$

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بهروز $\Rightarrow x$ $\qquad$ در یک ساعت $\quad \frac{1}{x}$

فرهاد $\Rightarrow x + 9$ $\qquad \Rightarrow \quad \frac{1}{x+9} \qquad \Rightarrow \quad \frac{1}{x} + \frac{1}{x+9} = \frac{1}{20}$

$\Rightarrow \dfrac{20x + 180 + 20x}{20x\cancel{(x+9)}} = \dfrac{x(x+9)}{20x\cancel{(x+9)}}$

$\Rightarrow 40x + 180 = x^2 + 9x \quad \Rightarrow x^2 - 31x - 180 = 0$

$x = 36 \qquad \underset{\text{غ ق ق}}{x = -5} \quad \Leftarrow \quad (x - 36)(x + 5) = 0$

$\quad \| $

در ۳۶ ساعت $\qquad$ ۳۶

SEVIL