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نام و نام خانوادگی زهرا سادات حسینی .... پاسخنامه تشریحی تکلیف شماره ۴..... کلاس یازدهم تجربی B.......

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الف) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0 \to \frac{x-1}{x} \geq \frac{x}{x-1}$

$\hookrightarrow \frac{x^2+1-x^2-2x}{x(x-1)} = \frac{-2x+1}{x(x-1)} \geq 0 \to \frac{1}{2}$

x		0		$\frac{1}{2}$		1	
	$+$		$-$	0	$+$		$-$

$x<0 \to \frac{x-1}{x} - \frac{x}{x-1} \geq 0$ ✓

$x=0 \to$ تعریف نشده $+0$ ✗

$x>0 \to \frac{x-1}{x} - \frac{x}{x-1} \geq 0$ ✗

به جز $[\frac{1}{2},1)$

$\to D_f = (-\infty,0) \cup [\frac{1}{2},1)$

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ب) $\dfrac{\frac{2}{x+1} - \frac{2}{x}}{\frac{3}{x-1} + \frac{1}{x+2}}$; -1 , 0 ; 1 , -2 ; مخرج $\neq 0 \to x \neq \{1,-2,-\frac{5}{4}\} \to D_f = \mathbb{R} - \{-2,-\frac{5}{4},1,-1,0\}$

$\frac{3x+6-1+x}{(x-1)(x+2)} \to 4x+5 = 0 \to x = -\frac{5}{4}$

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الف) $\left((\frac{1}{3})^x - 9\right)\left(32 - 4^x\right) \geq 0 \to \begin{cases} (\frac{1}{3})^x = 3^2 \to x = -2 \\ 4^x = 32 \to 2^{2x} = 2^5 \to 2x = 5 \to \boxed{x = \frac{5}{2}} \end{cases}$

x		-2		$\frac{5}{2}$	
	$+$	0	$-$	0	$+$

$\to D_f = (-\infty,-2] \cup [\frac{5}{2},+\infty)$

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ب) $\sqrt{y+1} = 3 - \sqrt[4]{x-1}$

$x \geq 1$, $0 \leq 3 - \sqrt[4]{x-1} \to 3 \geq \sqrt[4]{x-1} \to |x-1| \leq 81 \to -81 \leq x-1 \leq 81 \to -80 \leq x \leq 82$

$\to D_f = [1,82]$

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$f(x) = \dfrac{\log_4 (x^2-x-2)}{\sqrt{x^2-1}+1} \to x^2-1 \geq 0 \to \begin{matrix} x \geq 1 \\ x \leq -1 \end{matrix} \to (-\infty,-1] \cup [1,+\infty)$

$\log_4^{x^2-x-2} \to x^2-x-2 > 0 \to (x-2)(x+1) > 0$; 2 , -1

x		-1		2	
	$+$	0	$-$	0	$+$

$\to (-\infty,-1) \cup (2,+\infty)$

$\Longrightarrow D_f = (-\infty,-1) \cup (2,+\infty)$

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$\sqrt{3+ax-x^2} \xrightarrow{x=-2} 3-2a-4 = 0 \to -2a = 1 \to \boxed{a = -\frac{1}{2}}$

$b \Rightarrow x_1 x_2 = \frac{c}{a} = \frac{3}{-1} \to -2x_2 = -3 \to \boxed{x_2 = \frac{3}{2}}$

$a+b=1$

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$f(x) - x \geq 0$

$f(x) \geq x \quad \to D_f = [-3,+\infty)$

$\begin{cases} 3x-2 \ ; \ x \geq 1 \to (1,1),(2,4),\dots ✓ \\ 2x+3 \ ; \ x < 1 \to (0,3),(-1,1),(-2,-1),(-3,-3) ✓,(-4,-5) ✗ \end{cases}$

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$$2f(5) = f(-2) + a$$

$$2(a+1)\underbrace{(5+2)}_{7} = 3a + 2(-2) + a \to \cancel{2}(7a+7) = \cancel{2}(2a-2) \to 5a = -9 \Rightarrow$$ ۶

$$a = \frac{-9}{5} = -1.8$$

$$f(2-\sqrt{3}) + f(2+\sqrt{3}) = \sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}} + 2 + \sqrt{2+\sqrt{3}} + \sqrt{2-\sqrt{3}} + 2$$

$$2-\sqrt{3} = \frac{1}{2+\sqrt{3}}$$

$$2+\sqrt{3} = \frac{1}{2-\sqrt{3}}$$

$$= 4 + 2\underbrace{\left(\sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}}\right)}_{A} = 4 + 2\sqrt{6}$$ ۷

$$A^2 = 2 - \cancel{\sqrt{3}} + 2 + \cancel{\sqrt{3}} + 2\sqrt{\cancel{2-\sqrt{3}}} \times \frac{1}{\sqrt{\cancel{2+\sqrt{3}}}}$$

$$A^2 = 6 \to A = \sqrt{6}$$

$$\begin{cases} 2f(x) - 3f(-x) = 4x^2 - x \xrightarrow{\times 2} \\ 2f(-x) - 3f(x) = 4x^2 + x \xrightarrow{\times 3} \end{cases}$$

$$\begin{cases} 4f(x) - \cancel{6f(-x)} = 8x^2 - 2x \\ \cancel{6f(-x)} - 9f(x) = 12x^2 + 3x \end{cases}$$ ۸

$$-5f(x) = 20x^2 + x \to f(x) = -4x^2 - \frac{x}{5}$$

$$\xrightarrow{x=0} 2f(0) = 3m - 1 \to f(0) = \frac{3m-1}{2}$$

$$\xrightarrow{x=-2} -3(-2)f(0) = 16 + 2m + 3m - 1 \to 6f(0) = 15 + 5m \to \frac{15+5m}{6} = f(0)$$

$$\to \frac{3m-1}{\cancel{2}\,1} = \frac{15+5m}{\cancel{6}\,3} \to 9m - 3 = 15 + 5m \to 4m = 18 \to m = \frac{18}{4} = \boxed{\frac{9}{2}}$$ ۹

$$\to f(0) = \frac{3\times\frac{9}{2} - 1}{2} = \frac{\frac{27}{2} - \frac{2}{2}}{2} = \frac{\frac{25}{2}}{2} = \boxed{\frac{25}{4}}$$

$$f(x) = ax + b$$

$$f\left(\frac{1}{x}\right) = \frac{a}{x} + b$$

$$\to f(x) + f\left(\frac{1}{x}\right) = ax + b + \frac{a}{x} + b = \frac{ax^2 + a + 2bx}{\cancel{x}} = \frac{3x^2 - 12x + 3}{\cancel{x}}$$

$$\to \begin{cases} a = 3 \\ +2b = -12 \to b = -6 \end{cases} \to f(x) = 3x - 6 \to f(-1) = -3 - 6 = \boxed{-9}$$ ۱۰