نام و نام خانوادگی [illegible] .... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

۱

الف) $f(x)=\sqrt{\frac{x-1}{x}-\frac{x}{x-1}}$

$\frac{x-1}{x}-\frac{x}{x-1}\geq 0 \to \frac{-2x+1}{x^2-x}$

	0		$\frac12$		1	
$+$		$-$		$+$		$-$

$D_f=(-\infty,0)\cup[\frac12,1)$

ب) $f(x)=\dfrac{\frac{1}{x+2}-\frac{2}{x}}{\frac{3}{x-1}+\frac{1}{x+2}} \to \dfrac{\frac{x-2x-4}{x^2+2x}}{\frac{3x+6+x-1}{x^2+x-2}} \to \dfrac{(x^2+x-2)(x-2x-4)}{(4x+5)(x^2+2x)}$

$R-\{-\frac54,-2,0,1\}$

۲

الف) $f(x)=\sqrt{((\frac12)^x-9)(32-4^x)}$

$32=4^x \to \boxed{x=\frac52}$ ≥ -2

$(\frac13)^x-9=0$, $(\frac13)^x=9$, $\boxed{x=-2}$

	-2		$\frac52$	
$+$		$-$		$+$

$D_f=(-\infty,-2]\cup[\frac52,+\infty)$

$\sqrt{y+1}=3-\sqrt[4]{x-1} \to 3-\sqrt[4]{x-1}\geq 0 \to x-1\geq 0 \to x\geq 1$

$3^4\geq x-1 \to 81\geq x-1 \to 82\geq x$

$D_f=[1,82]$

۳

$f(x)=\dfrac{\log_4^{x^2-x-2}}{\sqrt{x^2-1}+1}$

$x^2-x-2>0 \to$

	-1		2	
$+$		$-$		$+$

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

$(x-2)(x+1)$

$x^2-1\geq 0 \to x^2\geq 1 \to x\geq 1$ یا $x\leq -1$

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

۴

$\sqrt{3-\frac12x-x^2}$

$-4-2a+3=0$

$-2a-1=0 \to \boxed{a=-\frac12}$

$\frac14+12=12.25$

$\frac{0.5\pm3.5}{-2}=-1.5$ $\boxed{b=+1.5}$

$-0.5+1.5=\boxed{1}$

۵

	-3		1	
		$-$		$+$

$2f(x)-x\geq 0$

$f(x)\geq x$

$f(x)=\begin{cases}3x-2; & x\geq 1 \\ 2x+3; & x<1\end{cases}$

$3x-2-x\geq 0 \to 2x-2\geq 0 \to x\geq 1$

$2x+3-x\geq 0 \to x+3\geq 0 \to x\geq -3$

$-3\leq x<1$

$D_f=[-3,+\infty)$

۶

$f(-2) = -4 + 3a$

$f(5) = 7a + 7$

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

$14a + 14 = -4 + 3a + a$

$\boxed{a = -1/8}$

۷

$$f(x) = \frac{\sqrt{x}^2 + 2\sqrt{x} + 1}{\sqrt{x}} = \frac{(\sqrt{x}+1)^2}{\sqrt{x}} = \sqrt{x} + \frac{1}{\sqrt{x}} + 2$$

$x_1 = 2 + \sqrt{3}$

$x_2 = 2 - \sqrt{3}$

$\sqrt{x} = a$

$f(x_1) = a + \frac{1}{a} + 2$

$f(x_2) = \frac{1}{a} + a + 2$

$x_1 \times x_2 = 4 - 3 = 1$

ضرب ۲ عدد ۱ بوده

پس معکوس هم بودند

$x_1 = \frac{1}{x_2}$

$a^2 + \frac{1}{a^2} = 2 + \sqrt{3} + 2 - \sqrt{3} = 4$

$(a + \frac{1}{a})^2 = a^2 + \frac{1}{a^2} + 2 = 6$

$a + \frac{1}{a} = \sqrt{6}$

$f(x_1) + f(x_2) = 2(a + \frac{1}{a} + 2) \rightarrow \boxed{4 + 2\sqrt{6}}$

۸

$$\left.\begin{array}{l} 2f(x) - 3f(-x) = 4x^2 - x \\ 2f(-x) - 3f(x) = 4x^2 + x \end{array}\right\}$$

$4f(x) - 6f(-x) - 9f(x) + 6f(-x) =$

$-5f(x) = 8x^2 - 2x + 12x^2 + 3x = 20x^2 + x$

$-5f(x) = 20x^2 + x$

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

۹

$(2)f(0) - 0 = 3m - 1$

$2f(0) = 3m - 1 \rightarrow f(0) = \frac{9m - 3}{6}$ (I)

$x = -2 \rightarrow 0f(-2) + 6f(0) = 16 + 2m + 3m - 1 = 15 + 5m$

$6f(0) = 15 + 5m \rightarrow f(0) = \frac{15 + 5m}{6}$ (II)

$$\left.\begin{array}{l} \mathrm{I} \\ \mathrm{II} \end{array}\right\} \begin{array}{l} 9m - 3 = 15 + 5m \\ 4m = 18 \\ m = \frac{18}{4} \end{array}$$

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

۱۰

$x = 1 \rightarrow f(1) + f(1) = 3 - 12 + 3$

$2f(1) = -6$

$f(1) = -3$

$x = -1 \rightarrow f(-1) + f(-1) = \frac{3 + 12 + 3}{-1} = -18$

$2f(-1) = -18 \rightarrow \boxed{f(-1) = -9}$