نام و نام خانوادگی ......[illegible]...... پاسخنامه تشریحی تکلیف شماره ...۴... کلاس ...یازدهم تجربی...

۱

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

0	$\frac{1}{2}$	1
$+$ ∄ $-$	∅ $+$	∄ $-$

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

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

ب) $f(x)=\frac{\frac{1}{x+1}-\frac{2}{x(x+1)}}{\frac{3}{x-1}+\frac{1}{x+2}}$; $x\neq -1$; $x\neq 0$

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

$\to D_f=\mathbb{R}-\{-2,-\frac{5}{4},-1,0,1\}$

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الف) $f(x)=\sqrt{\left(\left(\frac{1}{3}\right)^x-9\right)\left(32-4^x\right)}\geq 0$

$x=-2$

~~$32=4^x \to x=\log_4 32$~~

$2^5=2^{2x} \to 2x=5 \to x=\frac{5}{2}$

-2	$\frac{5}{2}$
$+$ ∅ $-$	∅ $+$

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

$a=b^c$

ب) $\sqrt[4]{x-1}+\sqrt{y+1}=3$; $\sqrt{y+1}=-\sqrt[4]{x-1}+3 \to 3-\sqrt[4]{x-1}\geq 0 \to 81-x+1\geq 0$; $82\geq x$

$x\geq 1 \to [1,82]=D_f$

۳

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

$x^2-1\geq 0$

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

$x^2-x-2>0$

$(x-2)(x+1)>0$; 2 ; -1

-1	2
$+$ ∅ $-$	∅ $+$

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

۴

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

$D_f=[-2,b]$

$a+b=?$

$-x^2+ax+3\geq 0$

$x^2-ax-3\leq 0$

-2	b
$+$ ∅ $-$	∅ $+$

$(x+2)(x-b) \to (x+2)(x-\frac{3}{2}) \to x^2+\frac{1}{2}x-3\leq 0$

$-2b=-3$

$b=\frac{-3}{-2}=\frac{3}{2}$

$a+b=\frac{3}{2}-\frac{1}{2}=\frac{2}{2}=\boxed{1}$

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

$3x-2\geq x$; $2x\geq 2$; $x\geq 1$

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

$g(x)=\sqrt{f(x)-x}$

$D_g=?$

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

$D_g=[-3,\infty)$

$2(a+1)(\Delta+2) = 2a+2(-2)+a$

$2(5a+2a+5+4) = 3a-3$

$14a+14 = 3a-3$

$10a = -17$

$a = \frac{-17}{10} \rightarrow -\frac{9}{5}$ ۶

$\sqrt{x_1}\left(\frac{1}{\sqrt{x_2}}\right) + 2 + \sqrt{x_2}\left(\frac{1}{\sqrt{x_1}}\right) + 2 = 4 + 2\sqrt{x_1} + 2\sqrt{x_2}$

$\sqrt{x_2}$ $\sqrt{x_1}$

$4 + 2\sqrt{2-\sqrt{2}} + 2\sqrt{2+\sqrt{2}}$

$f(\underbrace{2-\sqrt{2}}_{x_1}) + f(\underbrace{2+\sqrt{2}}_{x_2})$

$2(\underbrace{\sqrt{2-\sqrt{2}} + \sqrt{2+\sqrt{2}}}_{A}) = 4 + 2\sqrt{4}$

$A^2 = 4$ ۸

$(2f(x) - 2f(-x) = 4x^2 - x) \times 2$

$(2f(-x) - 2f(x) = 4x^2 + x) \times 3$

$\{f(x) - 4f(-x) = 8x^2 - 2x$

$4f(-x) - 9f(x) = 12x^2 + 3x \rightarrow f(x) = \frac{20x^2 + x}{-5} \rightarrow \boxed{-4x^2 - \frac{x}{5}}$ ۷

$x = 0 \rightarrow 2f(0) = 2m - 1$

$f(0) = \frac{2m-1}{2}$

$\frac{2m-1}{2} = \frac{5m+10}{4}$

$12m - 4 = 10m + 20$

$2m = 24 \rightarrow m = \frac{24}{2}$

$\boxed{f(0) = \frac{32}{5}}$ ۹

$x = -2 \rightarrow 4f(0) = 4m + 2m - 1$

$4f(0) = 10 + 5m \rightarrow f(0) = \frac{5m+10}{4}$

$\frac{2\times\frac{9}{2} - 1}{2} = \frac{20}{\frac{1}{2}} = \frac{32}{5}$

$x = -1 \rightarrow 2f(-1) = \frac{2+12+2}{-1}$

$2f(-1) = -8$

$\boxed{f(-1) = -4}$ ۱۰