نام و نام خانوادگی ...دانیال مقدس......... پاسخنامه تشریحی تکلیف شماره ...۴... کلاس ..دوازدهم ریاضی A......

۱

الف) $y=\left(2\left(\frac{x}{2}-\left[\frac{x}{2}\right]\right)\right)^2 \xrightarrow{\frac{x}{2}=t} y=4(t-[t])^2$

$0\le t-[t]<1 \to 0\le (t-[t])^2<1 \to 0\le 4(t-[t])^2<4$ $\boxed{R_f=[0,4)}$

ب) $\log y=\sin x+4 \to y=10^{\sin x+4}$

$-1\le \sin x\le 1 \to 3\le \sin x+4\le 5$

$10^3\le \sin x+4\le 10^5 \to 1000\le \sin x+4\le 100000$ $\boxed{R_f=[1000,100000]}$

۲

$y=\sqrt{\frac{x^2-4}{x^2-9}} \to \frac{x^2-4}{x^2-9}=y^2 \to x^2=-\frac{-9y^2+4}{y^2-1}=\frac{9y^2-4}{y^2-1}$

$x=\pm\sqrt{\frac{9y^2-4}{y^2-1}}$ $\frac{9y^2-4}{y^2-1}\ge 0 \to \frac{(3y-2)(3y+2)}{(y-1)(y+1)}\ge 0$

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

$R_f=(-\infty,-1)\cup[\underbrace{-\frac{2}{3}}_{a},\underbrace{\frac{2}{3}}_{b}]\cup(\underbrace{1}_{c},+\infty)$

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

۳

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

$\begin{cases} t\to(-\infty,-2]\cup[2,+\infty)\\ t\ge 0\to[2,+\infty)\end{cases}$

$\max t=+\infty\to f(x)=+\infty$

$\min t=2\to f(x)=2+2\sqrt{2}$

$-\frac{b}{2a}=-1 \times$

$\boxed{R_f=[2+2\sqrt{2},+\infty)}$

ب) $f(x)=3+3\sin x-\sin x-\sin^2 x=-\sin^2 x+2\sin x+3=-z^2+2z+3$

$-1\le z\le 1$

$\max z=1\to f(x)=4$

$\min z=-1\to f(x)=0$

$-\frac{b}{2a}=-\frac{2}{-2}=1\to f(x)=4$ $\boxed{R_f=[0,4]}$

۴

D_f	$\to$	R_f
۱		$\frac{29}{3}$
۲		
۳		
۴		
۵		
۶		
۷		
۸		
۹		$\frac{21}{3}$

$S_{21,29}=\frac{(21+22+\dots+29)}{3}=\frac{9\times 21+\overset{36}{\cancel{(1+\dots+8)}}}{3}=3\times 21+12=\boxed{75}$

۵

$f(x)$: $\begin{array}{c|c} & 2 \\ \hline - & + \end{array}$ $\to a=0 \to f(x)=\sqrt{bx+c}$

$f(3)=\sqrt{3b+c}=1 \to 3b+c=1$ $f(2)=\sqrt{2b+c}=0 \to 2b+c=0$

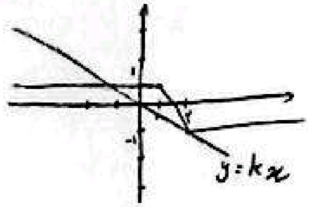
$b=1$ $c=-2$

$g(x)=\sqrt{bx^2-2c}=\sqrt{x^2+4}$

$y=bx^2-2c \to ext\Big|_{\sqrt{-2c}=\sqrt{4}=2}^{0}$

$R_g=\sqrt{[2,+\infty)}=\boxed{[\sqrt{2},+\infty)}$

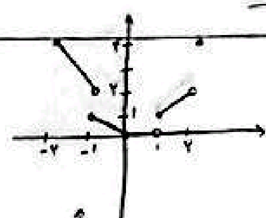
$y=|x-2|-|x-1|$



$y=kx \rightarrow (0,0)\quad (2,-1) \rightarrow k=\frac{0+1}{0-2}=\boxed{-\frac{1}{2}}$

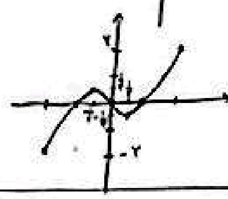
$\boxed{y=-\frac{1}{2}x}$ ۶

الف) $f(x)\begin{cases} -2\le x<-1 & -2x \\ -1\le x<0 & -x \\ 0\le x<1 & 0 \\ 1\le x<2 & x \\ x=2 & 2x \end{cases}$



$R_f = \mathbb{R}-\{2\}$ ۷

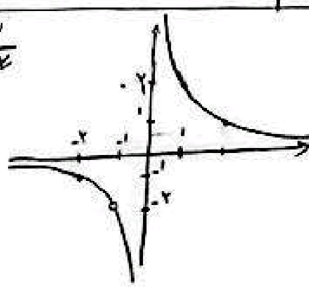
ب) $f(x)\begin{cases} x\ge 0 & x^2-x \\ x\le 0 & -x^2-x \end{cases}$



$R_f=[-2,2]$

$y=\frac{2x+2}{x^2+x}=\frac{2}{x}$

$D_f=\mathbb{R}-\{-1,0\}$



$R_f=\mathbb{R}-\{\underset{a}{-2},\underset{b}{0}\}$

$a+b=-2+0=\boxed{-2}$ ۸

$f(x)=\frac{(\sqrt{x}-1)(\sqrt{x}-3)}{(\sqrt{x}-1)(\sqrt{x}-1)}=\frac{\sqrt{x}-3}{\sqrt{x}-1}=y \rightarrow \sqrt{x}=-\frac{-y+3}{y-1}=\frac{y-3}{y-1}$

$D_f=\mathbb{R}-\{1\}$ ۹

$\sqrt{x}=\frac{y-3}{y-1}$

$x=(\frac{y-3}{y-1})^2 \rightarrow \mathbb{R}-\{1\}$

$\boxed{R_f:[0,+\infty)-\{1\}}$ مقابل رادیکال همواره مثبت

$D_f=\mathbb{R}-\{-1,1\}$

$f(x)=\frac{x^3+2x^2-x-2}{x^2-1}=\frac{(x+2)(x^2-1)}{x^2-1}=x+2$

حفرات $\rightarrow x=1 \rightarrow \boxed{y=3}$ ۱۰

$\rightarrow x=-1 \rightarrow \boxed{y=1}$

$3+1=\boxed{4}$