یازدهم دختر — ونک آقایی — تکلیف شماره ۴

1.

الف) $\dfrac{\cancel{x^2}+1-2x-\cancel{x^2}}{x^2-x}=\dfrac{1-2x}{x^2-x}\geq 0 \longrightarrow$

	0		$\frac{1}{2}$		1	
$+$	○	$-$	●	$+$	○	$-$

$\boxed{(-\infty,0)\cup[\tfrac{1}{2},1)}$

ب) $\dfrac{\dfrac{x-2x-2}{x^2+x}}{\dfrac{3x+6+x-1}{x^2+1x-2}}=\dfrac{\dfrac{-x-2}{x^2+x}}{\dfrac{4x+5}{x^2+x-2}}\geq 0 \longrightarrow \boxed{\mathbb{R}-\{-1,0,-\tfrac{5}{4},-2,1\}}$

$x^2+x \rightarrow -1,0$

$x^2+x-2 \rightarrow -\frac{5}{4},1,-2$

2.

الف) $\left(\left(\frac{1}{3}\right)^x-9\right)\left(32-4^x\right)\geq 0 \longrightarrow x=\frac{5}{2},-2$

	-2		$\frac{5}{2}$	
$+$	●	$-$	●	$+$

$\boxed{(-\infty,-2]\cup[\tfrac{5}{2},+\infty)}$

ب) $x-1\geq 0 \longrightarrow x\geq 1$

$\underbrace{\sqrt{y+1}}_{+}=\underbrace{3-\sqrt[4]{x-1}}\longrightarrow 3-\sqrt[4]{x-1}\geq 0\longrightarrow 3\geq\sqrt[4]{x-1}\longrightarrow 81\geq x-1\longrightarrow 82\geq x$

پس این هم حتما مثبته

$\boxed{[1,82]}$

.3

$x^2-x-2>0 \to (x-2)(x+1)>0 \to$ $-1 \quad 2$: $+ \; - \; +$

$x^2-1\geq 0 \to$ $-1 \quad 1$: $+ \; - \; +$

$\boxed{(-\infty,-1)\cup(2,+\infty)}$

$\sqrt{x^2-1}+1\neq 0 \to \sqrt{x^2-1}\neq -1$ × همیشه درسته

.4

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

$-x^2-\frac{1}{2}x+3\geq 0 \to \Delta=+\frac{1}{4}\underbrace{-4(3\times -1)}_{+12}>0$

$-x^2-\frac{1}{2}x+3=0 \to \Delta=\frac{49}{4} \to \frac{-b\pm\sqrt{\frac{49}{4}}}{-2}=\frac{-\frac{1}{2}\pm\frac{7}{2}}{-2}=-\frac{3}{2}$

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

.5

$x\geq 1 \to \sqrt{3x-2-x} \to \sqrt{2x-2} \to x\geq 1$

$x<1 \to \sqrt{2x+3-x} \to x\geq -3$

$\sqrt{f(x)-x} \to f(x)\geq x \to x\geq -3$ ✓ $\boxed{[-3,+\infty)}$

.6

$2(a+1)(7)=3a-4+a \to 7(2a+2)=4a-4 \to 14a+14=4a-4 \to 10a=-18$

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

.7

$\left(\sqrt[4]{x}+\frac{1}{\sqrt[4]{x}}\right)^2 \Rightarrow \left(\sqrt[4]{2-\sqrt{3}}+\frac{1}{\sqrt[4]{2-\sqrt{3}}}\right)^2+\left(\sqrt[4]{2+\sqrt{3}}+\frac{1}{\sqrt[4]{2+\sqrt{3}}}\right)^2$

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

$\sqrt{2+\sqrt{3}}+\sqrt{2-\sqrt{3}}+2$ (2) $\quad$ (1)+(2) $=2\left(\sqrt{2-\sqrt{3}}+\sqrt{2+\sqrt{3}}\right)+4=\boxed{4+2\sqrt{6}}$

$\sqrt{2-\sqrt{3}}+\sqrt{2+\sqrt{3}}=A \to A^2=4+2=6 \to A=\sqrt{6}$

Subject: Date:

.8

$2f(x)-3f(-x)=4x^2-x \longrightarrow 4f(x)-\cancel{6f(-x)}=8x^2-2x$

$2f(-x)-3f(x)=4x^2+x \longrightarrow \cancel{6f(-x)}-9f(x)=12x^2+3x \xrightarrow{\text{جمع}} -5f(x)=x^2+x$

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

.9

$2f(0)=3m-1 \longrightarrow f(0)=\frac{3m-1}{2}$

$x=-2 \longrightarrow 6f(0)=\underbrace{16+2m+3m-1}_{15+5m} \rightarrow \frac{15+5m}{6}=f(0)$

$\left\{\frac{3m-1}{2}=\frac{15+5m}{\cancel{6}\,3}\right.$

$15+5m=9m-3$

$\frac{9}{2}=m \longleftarrow 18=4m$

$2f(0)=\underbrace{\frac{27}{2}-1}_{\frac{25}{2}} \longrightarrow \boxed{f(0)=\frac{25}{4}}$

.10

$ax+b+\frac{a}{x}+b=\frac{3x^2-12x+3}{x} \longrightarrow -a+b-a+b=\frac{3+12+3}{-1} \rightarrow -2a+2b=-18$

$b-a=-9$ (1)

$x=1 \longrightarrow a+b+a+b=\frac{3-12+3}{1} \longrightarrow 2a+2b=-6 \rightarrow a+b=-3$ (2)

(1) , (2) $\xrightarrow{\text{جمع}} 2b=-12 \longrightarrow \boxed{b=-6}$ $\boxed{a=3}$

$x=-1 \longrightarrow -3-6$

$=\boxed{-9}$

s.a.m