نام و نام خانوادگی ...لیلا عباسی... پاسخنامه تشریحی تکلیف شماره ...۵... کلاس ...11 A...

۱

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

$x^3 f(x+1) \geq 0 \Longrightarrow$

$\frac{1}{2}^{x-1} = 1 \to x=1$

		0	1
x^3	−	+	+
$f(x+1)$	+	+	−
	−	+	−

$D = [0,1]$

۲

$f(-x) = \sqrt{-x+|2-x|} \to D_{f(-x)} \Rightarrow -x+|2-x| \geq 0$

$-x+2-x \geq 0 \to -2x \geq -2 \to 2x \leq 2 \to x \leq 1$

$-x+x-2 \geq 0$ نمی شود

$\Rightarrow D = (-\infty, 1]$

۳

$\frac{x-1}{f(x)} \geq 0$

		−4		1		2	
$x-1$	−		−	0	+		+
$f(x)$	+	0	−		−	0	+
y	−		+		−		+

$\to D = (-4, 1] \cup (2, +\infty)$

۴

$9x^4 - 7x^2 - 4x - 3 \neq 0 \to (3x^2-x-3)(\underbrace{3x^2+x+1}_{\text{همواره مثبت}}) \neq 0 \Rightarrow 3x^2-x-3 \neq 0 \to D_{y_1} = R - \left\{\frac{1\pm\sqrt{37}}{6}\right\}$

$3x^2+ax+b \neq 0 \to D_{y_2} = D_{y_1} \to x_{y_2} = \frac{-a\pm\sqrt{a^2-12b}}{6} = \frac{1\pm\sqrt{37}}{6} \Rightarrow -a = 1 \to a = -1$

$a^2 - 12b = 37 \xrightarrow{a=-1} 1 - 12b = 37 \to b = -3$

$\sqrt{-(a+b)} = \sqrt{-(-1-3)} = \sqrt{4} = 2, -2$

۵

$f(x) - f(\frac{4}{x}) \geq 0 \to f(x) \geq f(\frac{4}{x}) \to x^3 + x \geq \frac{64}{x^3} + \frac{4}{x}$

−2		0		2	
−		+		−	+

$\to (-2, 0] \cup [2, +\infty)$

$0, 2, -2$

$x^3+x=2 \to x=1$ $\quad f(2)=2-1=1$ $x^3+x=10 \to x=2 \to f(10)=2(4)-1=7$ $f(2)+f(10)=1+7=8$	۶
$f(x)=x^3-6x^2+12x=(x-2)^3+8$ $\quad \frac{g(\sqrt[3]{7}-3)}{f(\sqrt[3]{2}+2)}=\frac{(\sqrt[3]{7}-3+3)^3-27}{(\sqrt[3]{2}+2-2)^3+8}$ $g(x)=x^3+9x^2+27x=(x+3)^3-27$ $\Rightarrow \frac{(\sqrt[3]{7})^3-27}{(\sqrt[3]{2})^3+8}=\frac{7-27}{2+8}=\frac{-20}{10}=-2$	۷
$(f(x)+g(x))^2=(a+b\sqrt{x+c})^2 \to \sqrt{x+4\sqrt{x-4}}^2+\sqrt{x-4\sqrt{x-4}}^2+2\sqrt{x-4\sqrt{x-4}}\sqrt{x+4\sqrt{x-4}}=2x+2\|x-8\|$ $x\geq 8 \to 2x+2x-16=4x-16=4(x-4) \to \sqrt{4(x-4)}=a+b\sqrt{x+c}$ $\to 2\sqrt{x-4}=a+b\sqrt{x+c} \to b=2,\ a=0,\ c=-4$ $\quad \frac{a+b}{c}=\frac{0+2}{-4}=-\frac{1}{2}$	۸
$g(x)=\{(2,1)(1,0)(3,5)(0,4)\}$ $\quad f(x)=\{(2,-4)(1,\overset{\text{ت ن}}{\frac{3}{0}})(0,\frac{2}{3})(3,\overset{\text{ت ن}}{\frac{5}{0}})\}$ $\frac{g}{f}=\{(2,\frac{-1}{4})(0,6)\}$	۹
$f(x)=\{(\frac{1}{2},2)(\frac{3}{2},-1)(2,2)(-\frac{1}{2},4)\}$ $f(x^2)=\{(1,2)(-1,2)(\sqrt{3},-1)(-\sqrt{3},-1)(2,2)(-2,2)\}$ $2g^2(x)+1=\{(-2,19)(1,3)(3,9)(-1,1)\}$ $\frac{2f}{g}=\{(1,-4)(3,-1)\}$	۱۰