رسا صادق زاده یازدهم ریاضی ۸

سوال ۱)

$y=\sqrt{x^3 f(x+1)}$ $\quad f(x)=\left(\frac{1}{2}\right)^{x-2}=f(x)=2^{-x+2}$

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

$\Rightarrow y=\sqrt{x^3 \times 2^{-x+1}} \rightarrow x^3 \times 2^{-x+1} \geq 0 \Rightarrow x\geq 0$

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

$\Rightarrow D_f=[0,1]$ $\quad \Rightarrow -x+1\geq 0 \rightarrow -x\geq -1$

$x\leq 1$

سوال ۲)

$f(x)=\sqrt{x+|x+2|} \rightarrow f(-x)=? \xrightarrow{f(-x)} \sqrt{-x+|2-x|}$

$\Rightarrow -x+|2-x|\geq 0 \xrightarrow{if\ x\geq 0} -x-2+x\geq 0 \Rightarrow -2\geq 0$ ✗

$\xrightarrow{if\ x<0} -x+2-x=-2x+2\geq 0 \rightarrow x\leq 1 \Rightarrow D_f=(-\infty,1]$

سوال ۳)

$y=\sqrt{\frac{x-1}{f(x)}}$ $\quad \frac{x-1}{f(x)}\geq 0$

	-4		1		2		-3
$x-1$	$-$		$-$ 0 $+$		$+$		
$f(x)$	$+$ 0 $-$			$-$ 0 $+$		0	
$\frac{x-1}{f(x)}$	$-$	$+$	0 $+$	$-$		$+$	

$D_f=(-4,1]\cup(2,-3)$

سوال ۴)

$D_{y_1}=D_{y_2} \rightarrow$ مخرج نباید صفر شود $\quad \frac{1}{9x^4-7x^2-4x-3}$

$\underbrace{(9x^4-6x^2+1)}_{(3x^2-1)^2}\ \underbrace{-x^2-4x-4}_{-(x+2)^2} \rightarrow (3x^2-1)^2-(x+2)^2\neq 0$

$\hookrightarrow (3x^2-1)^2\neq(x+2)^2$

$\rightarrow 3x^2-1\neq x+2 \rightarrow 3x^2-x-3\neq 0$

$\hookrightarrow 3x^2+ax+b\neq 0 \Rightarrow a=-1,\ b=-3$

$\sqrt{-(-4)}=2$

سوال ۵)

$$y=\sqrt{x^4+x-\frac{64}{x^2}-\frac{4}{x}}=\sqrt{\frac{x^6+x^4-64-4}{x^2}}$$

$$\frac{x^6+x^4-64-4x^2}{x^2}\geq 0 \xrightarrow{x^2=t} t^3+t^2-4t-64=t^3-64+t^2-4t$$

$$=(t-4)(t^2+4t+16)+t(t-4)=(t-4)(t^2+5t+16)$$

$x=\pm 2 \Leftarrow x^2=4 \Leftarrow t=4 \Leftarrow \Delta=25-64<0$ ل

$-2 \quad 0 \quad 2$

$- \quad + \quad - \quad +$ $\Rightarrow D_f=[-2,0)\cup[2,+\infty)$

۶)

$$f(x^3+x)=2x^2-1 \qquad f(2)+f(10)=?$$

$x^3+x=2 \rightarrow x^3+x-2=0 \xrightarrow{\text{تقسیم}}$

$$\begin{array}{r|l} x^3+x-2 & x-1 \\ \cline{2-2} -x^3+x^2 & x^2+x+2 \\ \hline +x^2+x-2 & \\ -x^2+x & \\ \hline 2x-2 & \\ -2x+2 & \\ \hline 0 & \end{array}$$

$(x-1)(x^2+x+2)=0 \Rightarrow \boxed{x=1}$

$\Delta<0$

$\Rightarrow f(2)=1$

$x^3+x=10 \rightarrow \underbrace{x^3+x-8-2}$

$=(x-2)(x^2+4+2x)+(x-2)=(x-2)(x^2+2x+5)$

$\Rightarrow x=2 \Rightarrow f(10)=7$ $\quad \Delta<0$

$\Rightarrow f(2)+f(10)=1+7=8$

سوال ۷)

$$f(x)=x^3+12x-6x^2-8+8=(x-2)^3+8$$

$$g(x)=x^3+9x^2+27x+27-27=(x+3)^3-27$$

$$\frac{g(\sqrt[3]{7}-3)}{f(\sqrt[3]{2}+2)}=\frac{(\sqrt[3]{7})^3-27}{(\sqrt[3]{2})^3+8}=\frac{-20}{10}=-2$$

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سوال ۸)

$f(x) = \sqrt{x+4\sqrt{x-4}} = \sqrt{(\sqrt{x-4}+2)^2} = \sqrt{x-4}+2$

$g(x) = \sqrt{x-4\sqrt{x-4}} = \sqrt{(\sqrt{x-4}-2)^2} = |\sqrt{x-4}-2|$

$f(x)+g(x) = \sqrt{x-4}+2+|\sqrt{x-4}-2|$

$x>8 \rightarrow \sqrt{x-4}+2+\sqrt{x-4}-2 = 2\sqrt{x-4}$ ، $a=0$ ، $b=2$ ، $c=-4$ ، $\frac{a+b}{c} = \frac{-1}{2}$

$x=8 \rightarrow \sqrt{x-4}+2+0 \rightarrow a=2$ ، $b=-1$ ، $c=-4$ ، $\frac{a+b}{c} = -\frac{1}{4}$

$4<x<8 \rightarrow \sqrt{x-4}+2-\sqrt{x-4}+2 = 4 \rightarrow a=4$ ، $b=0$ ، $c \in R$

مقدار دقیق ندارد

سوال ۹)

$g(x) = \{(2,1),(3,0),(4,5),(0,4)\}$, $f(x) = \frac{x+2}{x^2-4x+3}$

$\frac{g}{f} =$

$x+2 \neq 0 \rightarrow x \neq -2$

$x^2-4x+3 \neq 0$

$(x-3)(x-1) \neq 0 \rightarrow x \neq 3,1$

$f(x) = \{(2,-4),(0,\frac{2}{3})\} \rightarrow \frac{g}{f} = \{(2,-\frac{1}{4}),(0,6)\}$

سوال ۱۰)

$g(x) = \{(-2,3),(1,-1),(3,2),(-1,0)\}$, $f(x)\{(1,2),(3,-1),(4,2),(-1,6)\}$

$f(2x) = \{(\frac{1}{2},2),(\frac{3}{2},-1)(2,2)(-\frac{1}{2},6)\}$

$f(x^2) = \{(1,2)(\sqrt{3},-1)(2,2)\}$

$2g^2(x+1)+1 = \{(-2,2\times9+1),(1,2\times(-1)^2+1),$

$(3,2\times2^2+1),(-1,2\times(0)+1)\} = \{(-2,19),(1,3)(3,9)(-1,1)\}$

$\frac{٢f}{g} = \{(١ ، -٤) ؛ (٣ ، -١)\}$