نام و نام خانوادگی ....الناهستی ابراهیمی.... پاسخنامه تشریحی تکلیف شماره ..۵.... کلاس ..یازدهم تجربی..........

۱۹٫۵

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$$f(x)=\left(\tfrac{1}{2}\right)^{x-2}-1 \rightarrow f(x+1)=\left(\tfrac{1}{2}\right)^{x+1-2}-1=\left(\tfrac{1}{2}\right)^{x-1}-1$$

$$y=\sqrt{x^3\times f(x+1)}=\sqrt{x^3\left(\left(\tfrac{1}{2}\right)^{x-1}-1\right)} \rightarrow x^3\left(\left(\tfrac{1}{2}\right)^{x-1}-1\right)\geq 0$$

$x=0$

$\left(\tfrac{1}{2}\right)^{x-1}=1 \rightarrow x-1=0 \Rightarrow x=1$

$$\begin{array}{ccccc} & 0 & & 1 & \\ - & | & + & | & - \end{array} \rightarrow \boxed{D_f=[0,1]}$$

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

$\rightarrow 2-x\geq x \rightarrow 1\geq x$

$\rightarrow 2-x\leq -x \rightarrow 2\leq 0 \rightarrow$ غیرممکن

$\Rightarrow \boxed{D_f=(-\infty,1]}$

۳

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

$x=1$

$x=-4,2,3$

$$\begin{array}{ccccccccc} & -4 & & 1 & & 2 & & 3 & \\ - & | & + & | & - & | & + & | & - \end{array}$$

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

۴

مخرج کسر نباید صفر شود.

$$y=\frac{1}{9x^4-7x^2-4x-3} \rightarrow 9x^4-7x^2-4x-3\neq 0 \rightarrow 9x^4-6x^2-x^2-4x-4+1\neq 0$$

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

$$(3x^2-1)^2-(x+2)^2\neq 0 \rightarrow 3x^2-1=x+2 \Rightarrow$$

$$3x^2-x=3 \rightarrow 3x^2-x-3=0$$

پس دو معادله با هم برابر است.

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

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

۵

$$y=\sqrt{f(x)-f\left(\tfrac{4}{x}\right)}=\sqrt{x^3+x-\frac{64}{x^3}-\frac{4}{x}} \rightarrow x^3+x-\frac{64}{x^3}-\frac{4}{x}\geq 0 \Rightarrow \frac{x^6+x^4-4x^2-64}{x^3}\geq 0$$

$$x^6+x^4-4x^2-64 \xrightarrow{x^2=t} t^3+t^2-4t-64=t^3-64+t^2-4t=(t-4)(t^2+4t+16)+t(t-4)$$

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

$t=4 \Rightarrow x^2=4$

$x=\pm 2$

$\Delta = 25-64<0$

$$\begin{array}{ccccccc} & -2 & & 0 & & 2 & \\ - & | & + & | & - & | & + \end{array}$$

$\boxed{D_f=[-2,0)\cup[2,+\infty)}$

$f(x^3+x)=2x^2-1$ $f(2)=f(x^3+x)\to x=1 \rightsquigarrow 2(1)^2-1=1$ $f(10)=f(x^3+x)\to x=2 \rightsquigarrow 2(2)^2-1=7$ $\Big\}\ f(2)+f(10)=1+7=8$ ۲	۶
$f(x)=x^3-6x^2+12x-8+8=(x-2)^3+8$ $g(x)=x^3+9x^2+27x+27-27=(x+3)^3-27$ ۲ $\dfrac{g(\sqrt[3]{7}-3)}{f(\sqrt[3]{2}+2)}=\dfrac{(\sqrt[3]{7}\cancel{-3+3})^3-27}{(\sqrt[3]{2}\cancel{+2-2})^3+8}=\dfrac{7-27}{2+8}=\dfrac{-20}{10}=-2$	۷
$f(x)=\sqrt{(x-4)+4\sqrt{x-4}+4}\to f(x)=\sqrt{(\sqrt{x-4}+2)^2}=\lvert\sqrt{x-4}+2\rvert$ $g(x)=\sqrt{(x-4)-4\sqrt{x-4}+4}\to g(x)=\lvert\sqrt{x-4}-2\rvert$ ۲ $f(x)+g(x)=a+b\sqrt{x+c}\to$ $\xrightarrow{4\leq x<8}\sqrt{x-4}+2-\sqrt{x-4}+2=4$ $\xrightarrow{x\geq 8}\sqrt{x-4}+2+\sqrt{x-4}-2=2\sqrt{x-4}$ $\to 2\sqrt{x-4}=a+b\sqrt{x+c}\Rightarrow a=0,\ b=2,\ c=-4$ $\to \dfrac{a+b}{c}=\boxed{-\dfrac{1}{2}}$	۸
$g(x)=\{(2,1),(1,0),(3,5),(0,4)\}$ $f(x)=\dfrac{x+2}{x^2-4x+3}\to f(2)=\dfrac{2+2}{2^2-8+3}=\dfrac{4}{-1}=-4$ ۲ $f(1)=\dfrac{1+2}{1-4+3}=\dfrac{3}{0}$ غ ق $f(3)=\dfrac{3+2}{9-12+3}=\dfrac{5}{0}$ غ ق $f(0)=\dfrac{0+2}{0-0+3}=\dfrac{2}{3}$ $\dfrac{g}{f}=\{(2,-\tfrac{1}{4}),\cancel{(1,\tfrac{0}{\frac{3}{0}})},\cancel{(3,\tfrac{5}{\frac{5}{0}})},(0,\tfrac{4}{\frac{2}{3}})\}=\boxed{\{(2,-\tfrac{1}{4})(0,6)\}}$	۹
الف) $f(2x)=\{(\tfrac{1}{2},2),(\tfrac{3}{2},-1),(2,2),(-\tfrac{1}{2},6)\}$ ۱,۵ ب) $f(x^2)=\{(1,2),(\sqrt{3},-1),(2,2)\}$ ج) $2g^2(x+1)=\{(-2,2\times 9+1)(1,2\times 1+1)(3,2\times 4+1)(-1,2\times 0+1)\}=\{(-2,19),(1,3),(3,9),(-1,1)\}$ د) $\dfrac{2f}{g}=\{(1,\tfrac{4}{-1}),\cancel{(-1,\tfrac{12}{0})},(3,\tfrac{-2}{2})\}=\{(1,-4),(3,-1)\}$	۱۰

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$$\begin{cases} x^۲=۱ \longrightarrow x=\pm ۱ \\ x^۲=۳ \longrightarrow x=\pm ۳ \\ x^۲=۴ \longrightarrow x=\pm ۲ \\ x^۲=-۱ \longrightarrow \times \end{cases} \longrightarrow \left\{(\pm ۱,۲)(\pm\sqrt{۳},-۱)(\pm ۲,۲)\right\}$$