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نام و نام خانوادگی ...مبینا بابائیان... پاسخنامه تشریحی تکلیف شماره ۵ ... کلاس یازدهم تجربی ...B...

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

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

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

$x^3 = 0 \Rightarrow x = 0$; $2^{-x+1} = 1 \Rightarrow -x+1 = 0 \Rightarrow x = 1$

$\begin{array}{ccccc} & 0 & & 1 & \\ - & 0 & + & 0 & - \end{array}$

$D_f = [0, 1]$

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$f(x) = \sqrt{x + |x+2|}$ $\qquad D_{f(-x)} = ?$

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

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

$-x + 2 \geq x \Rightarrow 2x \leq 2 \Rightarrow x \leq 1$

$x - 2 \leq -x \Rightarrow 2x \leq 2 \Rightarrow x \leq 1$

$D_f = (-\infty, 1]$

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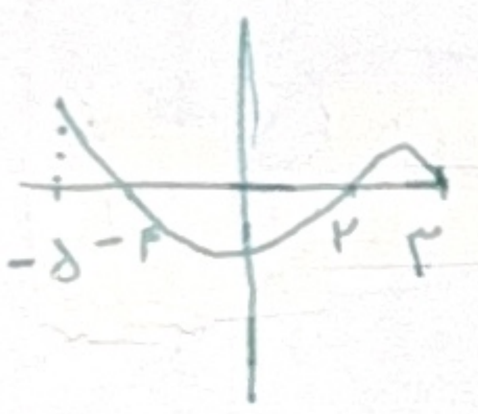
$y = \sqrt{\dfrac{x-1}{f(x)}} \geq 0$



	-4	1	2	3
$x-1$	$-$ $-$	0 $+$	$+$	$+$
$f(x)$	$+$ 0 $-$	$-$	0 $+$	0 $-$
$F(x)$	$-$	$+$ 0 $-$	$+$	$-$

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

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$y_1 = \dfrac{1}{9x^4 - 7x^2 - 4x - 3}$ $\qquad y_2 = \dfrac{1}{3x^2 + ax + b}$ $\qquad \sqrt{-(a+b)}$

$9x^4 - 6x^2 - x^2 - 4x - 4 + 1$

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

$a = -1$
$b = -3$

$\sqrt{-(-1-3)} = \sqrt{4} = 2$

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$f(x) = x^3 + x$ $\qquad y = \sqrt{f(x) - f\left(\frac{4}{x}\right)}$ $\qquad f\left(\frac{4}{x}\right) = \left(\frac{4}{x}\right)^3 + x = \frac{64}{x^3} + x$

$f(x) = x^3 + x \Rightarrow f(x) - f\left(\frac{4}{x}\right) = x^3 + \cancel{x} - \frac{64}{x^3} - \cancel{x} \Rightarrow x^3 - \frac{64}{x^3} \geq 0$

$\dfrac{x^6 - 64}{x^3} \geq 0$ $\qquad \dfrac{(x^2-4)(x^4 + 16 + 4x^2)}{x^3} \geq 0$; ± 2 ; $x^3 = 0$

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

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

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$f(x^3+x)=2x^2-1 \qquad f(2)+f(10)=?$ ۶

$f(2) \to \text{if } x=1 \Rightarrow f(1^3+1)=2(1^2)-1 \Rightarrow f(2)=2-1=1$

$f(10) \to \text{if } x=2 \to f(2^3+2)=2\times 2^2-1 \Rightarrow f(10)=8-1=7$

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

$f(x)=x^3-6x^2+12x \to f(x)=(x-2)^3+8$ ۷

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

$$\frac{g(\sqrt[3]{7}-3)}{f(\sqrt[3]{2}+2)}=?$$

$g(\sqrt[3]{7}-3)=(\sqrt[3]{7}\cancel{-3+3})^3-27=7-27=-20$

$f(\sqrt[3]{2}+2)=(\sqrt[3]{2}\cancel{-2+2})^3+8=2+8=10$

$\frac{-20}{10}=-2$

$f(x)=\sqrt{x+4\sqrt{x-4}} \qquad g(x)=\sqrt{x-4\sqrt{x-4}}$ ۸

$x\geq 4$

$f(x)+g(x)=a+b\sqrt{x+c}$

$\frac{a+b}{c}=?$

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

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

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

$a+b\sqrt{x+c} \Rightarrow c=-4$

$a+b=2 \longrightarrow \frac{a+b}{c}=\frac{2}{-4}=-\frac{1}{2}$

$f(x)=\frac{x+2}{x^2-4x+3} \qquad g(x)=\{(2,1),\cancel{(1,0)},\cancel{(3,5)},(0,4)\}$ ۹

$D_f \to \mathbb{R}-\{3,1\} \qquad D_f\cap D_g=\{2,0\}$

$(x-3)(x-1) \Rightarrow x\neq 3,1$

$f(2)=\frac{2+2}{4-8+3}=\frac{4}{-1}=-4$

$f(0)=\frac{0+2}{3}=\frac{2}{3}$

$\frac{g}{f} \to (2,\frac{1}{-4}),(0,\frac{4}{\frac{2}{3}}) \Rightarrow$

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

$f(x)=\{(1,2),(3,-1),(4,2),(-1,6)\} \qquad g(x)=\{(-2,3),(1,-1),(3,2),(-1,0)\}$ ۱۰

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

$2x=1 \Rightarrow x=\frac{1}{2}$

$2x=3 \Rightarrow x=\frac{3}{2},\ldots$

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

$x^2=1 \Rightarrow x=\pm 1$

$x^2=3 \Rightarrow \pm\sqrt{3}$

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

$x^2=-1$ غق

ج) $2g^2(x)+1=$

$2g^2(-2)+1 \to 2\times 3^2+1=19 \qquad 2g^2(3)+1 \Rightarrow 2\times 2^2+1=9$

$2g^2(1)+1 \to 2\times(-1)^2+1=3 \qquad 2g^2(-1)+1 \Rightarrow 2\times 0^2+1=1$

$2g^2(x)+1=\{(-2,19),(1,3),(3,9),(-1,1)\}$

د) $\frac{2f}{g}$

$D_f\cap D_g=\{1,3,-1\}$

$(1,\frac{2\times 2}{-1}),(3,\frac{2\times -1}{2}),\cancel{(-1,\frac{2\times 6}{0})}$

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