Date: / /　Sat Sun Man Tue Thu Wed Fri　Subject:

۲۰

ستایش تندرو　یازدهم ریاضی (پنجشنبه)　تکلیف شماره ۵

۱ـ دامنه؟

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

$$x^3 f(x+1)\geqslant 0 \qquad f(x+1)=\left(\frac{1}{2}\right)^{x-1}-1=2^{1-x}-1$$

$$\hookrightarrow \underbrace{x^3}_{0}\ (\underbrace{2^{1-x}-1}_{0})\geqslant 0 \qquad D_f=[0,1]$$

	0		1	
+	ϕ	+	ϕ	−

$x=0$

$\hookrightarrow 2^{1-x}=1 \Rightarrow 1-x=0 \Rightarrow x=1$

۲ـ

$$f(x)=\sqrt{x+|x+2|} \qquad f(-x)=\ \text{دامنه؟}$$

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

2	
$-x-x+2$	$-x+x-2$
$-2x+2$	-2

قرینه نشده

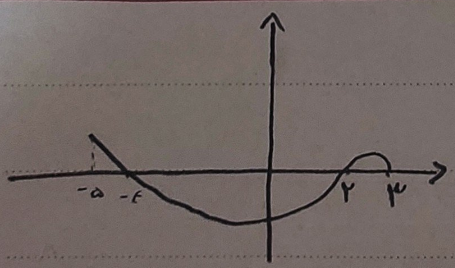
$-2x+2\geqslant 0$

$2(\underbrace{-x+1}_{1})\geqslant 0$

	1	
+	ϕ	−

$D_f=(-\infty,1]$

۳ـ



$$y=\sqrt{\frac{x-1 \to x=1}{f(x) \to x=-4,2,3}}$$

	−4		1		2		3	
−	ϕ	+	ϕ	−	ϕ	+	ϕ	−

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

۴ـ

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

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

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

$3x^2-1=x+2 \to 3x^2-x-3=0$

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

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

$f(x)=x^3+x \qquad y=\sqrt{f(x)-f\left(\frac{4}{x}\right)}$ —۵

$$y=\sqrt{x^3+x-\frac{64}{x^3}-\frac{4}{x}}=\sqrt{\frac{1}{x^3}(x^6-64)+\frac{1}{x}(x^2-4)}$$

$$=\sqrt{\frac{1}{x^3}(x^2-4)(x^4+16+4x^2)+\frac{1}{x}(x^2-4)}=\sqrt{\frac{1}{x}(x^2-4)\left(x^2+\frac{16}{x^2}+5\right)}$$

$0 \quad \pm 2 \quad \oplus$ همواره

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

$-\;\;-2\;\;+\;\;0\;\;-\;\;2\;\;+$

$f(x^3+x)=2x^2-1 \qquad f(2)+f(10)\to 1+7=8$ —۶

$x^3+x=2\to x=1\to f(2)=2-1=1$

$x^3+x=10\to x=2\to f(10)=8-1=7$

$f(x)=x^3-6x^2+12x+8-8=(x-2)^3+8 \qquad \dfrac{g(\sqrt[3]{7}-3)}{f(\sqrt[3]{2}+2)}$ —۷

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

$$\to\frac{(\sqrt[3]{7}-3+3)^3-27}{(\sqrt[3]{2}+2-2)^3+8}=\frac{\overset{-20}{\cancel{7-27}}}{\underset{+10}{\cancel{2+8}}}=-2$$

$f(x)=\sqrt{x+4\sqrt{x-4}-4+4}=\sqrt{(\sqrt{x-4}+2)^2}=\sqrt{x-4}+2$ —۸

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

$f(x)+g(x)=a+b\sqrt{x+c}\to\sqrt{x-4}+2+\sqrt{x-4}-2=2\sqrt{x-4}$

$\to a=0 \quad b=2 \quad c=-4 \qquad \dfrac{a+b}{c}=\dfrac{0+2}{-4}=-\dfrac{1}{2}$

Date: / / Sat Sun Man Tue Thu Wed Fri

Subject: ....

9

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

$D_f = \mathbb{R} - \{1, 3\}$

$x \to 1 \quad x \to 3$

2

$g(x) = \{(2,1)(1,0)(3,5)(0,4)\}$

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

10

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

2

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

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

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

$2g^2(x)+1 = ?$ $\{(-2, +19)(1,3)(4,9)(-1,1)\}$

$\frac{2f}{g} = \{(1,-4)(3,-1)\cancel{(-1, \frac{12}{0})}\} = \{(1,-4)(3,-1)\}$

تعریف نشده