موضوع: .... تاریخ: / /

۱۶٫۵

نیایش شاه‌نظری — تکلیف کد یک — یازدهم دفتر

① ۲

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

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

$\Downarrow$

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

$x = 0 \quad 2^{1-x} - 1 \rightarrow x = 1$

	0		1	
$-$		$+$		$-$

$D_f = [0, 1]$

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② ۱٫۵

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

$|x-2| - x \geq 0$

$|x-2| \geq x \rightarrow x - 2 \geq x \rightarrow -2 \geq 0$ ✗

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

$1 \geq x$

$x \leq 1$

$D_f = [1, +\infty)$

$D_f = (-\infty, 1]$

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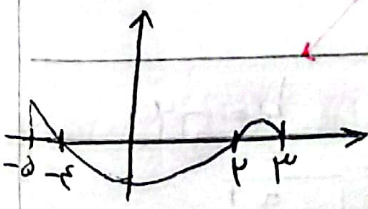
③ ۲



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

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

$x = 3, x = 2, x = -4$

	-4		1		2		3	
		$+$		$-$		$+$		

$D_f = [-5, 3]$ ①

② $D_y = (-4, 1] \cup (2, 3)$

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

موضوع:

تاریخ: / /

$y_1 = \frac{1}{9x^3 - 7x^2 - 4x - 2}$

$y_2 = \frac{1}{3x^2 + ax + b}$

$3x^2 - x - 2 = 3x^2 + ax + b$ ④

$a = -1, \quad b = -2$

⑤

$f(x) = x^3 + x$ ⑥

$y = \sqrt{f(x) - f\left(\frac{2}{x}\right)} \Rightarrow x^3 + x - \frac{8}{x^3} - \frac{2}{x} \geq 0$

$\left(x^3 - \frac{8}{x^3}\right) + \left(x - \frac{2}{x}\right) \geq 0$

$\left(x - \frac{2}{x}\right)\left(x^2 + \frac{4}{x^2} + 2\right) + \left(x - \frac{2}{x}\right) \geq 0 \rightarrow \left(x - \frac{2}{x}\right)\left(x^2 + \frac{4}{x^2} + 3\right) \geq 0$

$x = 2, \quad x = -2$

$\left(\frac{x^2 - 2}{x}\right)\left(\frac{x^4 + 3x^2 + 4}{x^2}\right) \geq 0$ ($x \neq 0$)

$-2 \quad 0 \quad 2$

$- \quad + \quad - \quad +$

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

⑤

$f(x^2 + x) = 2x^2 - 1 \rightarrow x = 1 \rightarrow f(2) = 2(1)^2 - 1 = 1$ ⑦

$f(2) + f(10) \rightarrow x = 3 \rightarrow f(10) = 2(10)^2 - 1 = 199$

$f(2) + f(10) = 199 + 1 = 200$

$f(10) = 2(3^2) - 1 = 17$

$1 + 7 = 8$

⑤

$f(x) = x^3 - 4x^2 + 12x \rightarrow (x-2)^3 + 8$ ⑧

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

$\frac{g(\sqrt[3]{7} - 3)}{f(\sqrt[3]{2} + 1)} = \frac{(\sqrt[3]{7} - 3 + 3)^3 - 27}{(\sqrt[3]{2} + 1 - 2)^3 + 8} = \frac{-20}{10} = -2$

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

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

⑧

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

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

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

$$14(x-4)$$

$$14x-56$$

$$2x+2\sqrt{x^2-14x+56}$$

$$2x+2\sqrt{(x-7)^2}=2x+2(x-7)=4x-14$$

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

$$\boxed{a=0}\ ,\ \boxed{b=2}\ ,\ \boxed{c=-4} \rightarrow \frac{a+b}{c}=\frac{2}{-4}=\boxed{\frac{-1}{2}}$$

$$f(x)=\frac{x+2}{x^2-4x+2}=\frac{x+2}{(x-1)(x-2)}\left\{(0,\tfrac{2}{2})(2,-\varepsilon)\right\}$$ ⑨

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

$$\frac{g}{f}\rightarrow\boxed{\left\{(2,\tfrac{-1}{\varepsilon})\ ,\ (0,4)\right\}}$$

$$f(x)=\left\{(1,2)\ ,\ (2,-1)\ ,\ (4,2)\ ,\ (-1,4)\right\}$$ ⑩

$$g(x)=\left\{(-2,2)\ ,\ (1,-1)\ ,\ (2,2)\ ,\ (-1,0)\right\}$$

ب) $f(2x)=\left\{(\tfrac{1}{2},2)\ ,\ (\tfrac{2}{2},-1)\ ,\ (2,2)\ ,\ (\tfrac{-1}{2},4)\right\}$

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

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

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