Year: یازدهم Month: تکلیف Dey : ۵ ( ) ۱۹

Subject: آزمون تیزرا

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

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$1 - x \leq 0$

$\underbrace{x^3}_{\leq 0}\ (\underbrace{2^{1-x} - 1}_{0}) \geq 0 \quad 2^{1-x} - 1 \leq 0 \longrightarrow 2^{1-x} \leq 1 \quad x \leq 1$

$D_f = R - \{0, 1\}$ $\quad D_f = [0, 1]$

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

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$|2-x| - x \geq 0 \longrightarrow 2 - x \geq x \longrightarrow 1 \geq x$

$x - 2 \geq x \longrightarrow 2 < 0 \longrightarrow$ غیرممکن

$fD = (-\infty, +1]$

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$y = \sqrt{\frac{x-1}{f(x)}}$ $\frac{1}{2}$

ریشه‌های مضاعف دار: $-4, 2, 3$

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-4	1	2	3

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

$\frac{x-1}{f(x)} \geq 0 \longrightarrow D_f = (-4, +1] \cup (2, 3)$

۴

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

$\underbrace{-x^2 - 4x - 4}_{-(x+2)^2}\ \underbrace{(9x^4 - 6x^2 + 1)}_{(3x^2-1)^2}$ $\quad \sqrt{-(a+b)} = \sqrt{4} = 2$

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

SAMA NOTEBOOK $3x^2 - x = 3 \longrightarrow 3x^2 - x - 3 = 0$

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

۵

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

$f(x) - f(\frac{4}{x}) \geq 0 \longrightarrow f(x) \geq f(\frac{4}{x})$

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$x^3 + x \geq \frac{64}{x^3} + \frac{4}{x} \longrightarrow x^3 - \frac{64}{x^3} \leq x - \frac{4}{x}$

$(x - \frac{4}{x})(x^2 + \frac{16}{x^2} + 4) + x - \frac{4}{x} \geq 0$ ۲،-۲

$x^2 + \frac{16}{x^2} + \cancel{4+1}^{\,5} \geq 0 \longrightarrow \frac{(x^4 + 16 + 5x^2)(x - \frac{4}{x})}{x^2} \geq 0$ دلتا کوچکتر از صفر

x^2 باید صفر نشه

	-2		0		$+2$	
$-$	0	$+$	$\cup$	$-$	0	$+$

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

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

۶

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

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$x = 1 \longrightarrow 2 \times 1 - 1 = 1$ $f(2) + f(10) = 8$

$x^3 + x = 10 \longrightarrow x = 2 \longrightarrow 2 \times 4 - 1 = 7$ $1 \quad 7$

۷

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

$f(\sqrt[3]{2} + 2) = (2 + 8 + 6\sqrt[3]{4} + 12\sqrt[3]{2}) - 6(\cancel{\sqrt[3]{4}} + \cancel{4\sqrt[3]{2}} + 4)$
$+ 12(\cancel{\sqrt[3]{2}} + \cancel{2}) = 10$ $g(x) = x^3 + 9x^2 + 27x$

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$g(\sqrt[3]{7} - 3) = (7 - 27 - \cancel{9\sqrt[3]{49}} + 27\sqrt[3]{7}) + 9(\cancel{\sqrt[3]{49}} - 6\sqrt[3]{7} + 9)$
$+ 27(\cancel{\sqrt[3]{7}} - 3) = 7 - 27 = -20$

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

⑧

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

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

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

$f(x) + g(x) = a + b\sqrt{x+c}$ 5 $\xrightarrow{[4,8]} \sqrt{x-4}+2+2$

$-\sqrt{x-4} = 4 \xrightarrow{x \geq 8} \sqrt{x-4} + 2 + \sqrt{x-4} - 2 = 0 + 2\sqrt{x-4}$

$\sqrt{x-4} \longrightarrow 0 + 2\sqrt{x-4} = a + b\sqrt{x+c} \longrightarrow$

$0 \quad 2 \quad -4$

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

⑨

$x^2 - 4x + 3 \neq 0 \longrightarrow (x-3)(x-1) \neq 0$

$3 \quad 1$ 1

$\frac{-2}{2} \longleftarrow \dfrac{x+2}{\underbrace{x^2-4x+3}_{1,3}}$

$f(2) = -4 \qquad f(0) = \frac{2}{3}$

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

⑩

$f(2x) = \{(\frac{1}{2}, 2), (1/5, -1), (2, 2), (\frac{-1}{2}, 6)\}$

$f(x^2) = \{(1, 2)(\sqrt{3}, -1)(-\sqrt{3}, -1)(2, 2)\}$ 1,75

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

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

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$$\begin{cases} x^{2}=1 \longrightarrow x=\pm 1 \\ x^{2}=3 \longrightarrow x=\pm 3 \\ x^{2}=4 \longrightarrow x=\pm 2 \\ x^{2}=-1 \longrightarrow \times \end{cases} \longrightarrow \left\{ (\pm 1, 2)(\pm\sqrt{3}, -1)(\pm 2, 2) \right\}$$