نام و نام خانوادگی ...علی ...... پاسخنامه تشریحی تکلیف شماره ...۵... کلاس ...یازدهم ...

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

$\rightarrow x^3\left(\left(\frac{1}{2}\right)^{x-1} - 1\right) \geq 0 \rightarrow$ $\begin{array}{ccccc} & 0 & & 1 & \\ - & \phi & + & \phi & - \end{array}$ $\rightarrow D_f = [0,1]$

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

$\rightarrow -x+|2-x| \geq 0$ $\begin{array}{c|c} \multicolumn{2}{c}{2} \\ -x-x+2 \geq 0 & -x+x-2 \geq 0 \\ -2x \geq -2 & -2 \geq 0 \\ x \leq 1 & \times \\ \checkmark & \end{array}$ $\rightarrow D_f = (-\infty, 1]$ 2

$y = \sqrt{\frac{x-1}{f_{(x)}}} \rightarrow \frac{x-1}{f_{(x)}} \geq 0 \rightarrow$ $\begin{array}{cccccc} -5 & -4 & 1 & 2 & 3 & \\ | & - \ \phi & + \ \phi & - \ \phi & + \ \phi & \end{array}$

تعریف نمی‌شود $f_{(x)}$ تعریف نمی‌شود $f_{(x)}$ 3

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

$y_1 = \frac{1}{9x^4 - 7x^2 - 4x - 3} \rightarrow 9x^4 - 7x^2 - 4x - 3 = 0$

$\rightarrow 9x^4 + 3x^3 + 3x^2 - 3x^3 - x^2 - x - 9x^2 - 3x - 3 = 0$

$y_2 = \frac{1}{3x^2 + ax + b}$ $\quad 3x^2(3x^2+x+1) - x(3x^2+x+1) - 3(3x^2+x+1) = 0$ 4

$\rightarrow (3x^2 - x - 3)\underbrace{(3x^2+x+1)}_{\text{ریشه ندارد}} = 0$

$\rightarrow 3x^2 + ax + b = 3x^2 - x - 3 \rightarrow a = -1 \quad b = -3 \rightarrow \sqrt{-(a+b)} = 2$

$f_{(x)} = x^3 + x \rightarrow y = \sqrt{f_{(x)} - f\left(\frac{4}{x}\right)} \rightarrow f_{(x)} - f\left(\frac{4}{x}\right) \geq 0$ 5

$\rightarrow x^3 + x - \frac{64}{x^3} - \frac{4}{x} \geq 0 \rightarrow \frac{(x^6 - 64) + (x^4 - 4x^2)}{x^3} \geq 0 \rightarrow \frac{(x^3-8)(x^3+8) + x^2(x^2-4)}{x^3} \geq 0$

$\frac{(x-2)(x+2)(x^2+2x+4)(x^2-2x+4) + (x-2)(x+2)x^2}{x^3} \geq 0 \rightarrow \frac{(x-2)(x+2)(x^4+5x^2+16)}{x^3} \geq 0$

$\begin{array}{cccccc} & -2 & & 0 & & 2 \\ - & \phi & + & \not| & - & \phi \ + \end{array}$ $\rightarrow D_f = [-2, 0) \cup [2, +\infty)$

$f_{(x^3+x)} = 2x^2 - 1$ ۶

$x=1 \to f_{(2)} = 1$

$x=2 \to f_{(10)} = 7$

$\Big\} \to f_{(2)} + f_{(10)} = 8$

$f_{(x)} = x^3 - 6x^2 + 12x \to f_{(x)} = (x-2)^3 + 8$

$g_{(x)} = x^3 + 9x^2 + 27x \to g_{(x)} = (x+3)^3 - 27$ ۷

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

$f_{(x)} = \sqrt{x + 4\sqrt{x-4}} \qquad g_{(x)} = \sqrt{x - 4\sqrt{x-4}} \qquad f_{(x)} + g_{(x)} = a + b\sqrt{x+c}$

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

$= |\sqrt{x-4} + 2| + |\sqrt{x-4} - 2| \longrightarrow \begin{array}{c|c} & 8 \\ 4 & 2\sqrt{x-4} \end{array} \to \begin{array}{l} a = 0 \\ b = 2 \\ c = -4 \end{array}$

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

$f_{(x)} = \dfrac{x+2}{x^2 - 4x + 3} \qquad g_{(x)} = \{(2,1), (1,0), (3,5), (0,4)\}$

$D_f = \mathbb{R} - \{1, 3\}$ ۹

$D_g = \{2, 1, 3, 0\}$

$\Big\} \xrightarrow{\cap} D_{\frac{g}{f}} = \{0, 2\} \to \dfrac{g}{f} = \{(0, 6), (2, -\tfrac{1}{4})\}$

$f_{(x)} = \{(1,2), (3,-1), (4,2), (-1,6)\} \qquad g_{(x)} = \{(-2,3), (1,-1), (3,2), (-1,0)\}$

الف) $f_{(2x)} = \{(\tfrac{1}{2}, 2), (\tfrac{3}{2}, -1), (2,2), (-\tfrac{1}{2}, 6)\}$ ۱۰

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

ج) $2g^2(x) + 1 = \{(-2, 19), (1,3), (3,9), (-1,1)\}$ د) $\dfrac{2f}{g} = \{(1,-4), (3,-1)\}$