نام و نام خانوادگی: فرناز الماسی — پاسخنامه تشریحی تکلیف شماره ۵ — کلاس یازدهم تجربی B

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

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

لـ، $x^3\left(\frac{1}{2}\right)^{x-1} - 1 \geq 0$

$\begin{array}{ccccc} & 0 & & 1 & \\ - & \vert & + & \vert & - \end{array} \longrightarrow D_f = [0, 1]$

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

$f(-x) = \sqrt{-x + |-x+2|} \longrightarrow -x + |-x+2| \geq 0 \longrightarrow -x + x - 2 \geq 0 \quad -2 \geq 0$ ✗

$\longrightarrow -x - x + 2 \geq 0 \quad -2x \geq -2$

$x \leq 1$

$D_f = (-\infty, 1]$

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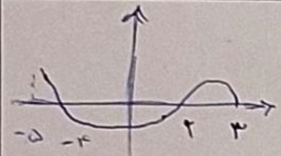

$y = \sqrt{\frac{x-1}{f(x)}} \longrightarrow x - 1 \geq 0 \quad x \geq 1 \quad [1, +\infty)$ ①

$\begin{array}{c|ccccccc} & & -4 & & 2 & & 3 & \\ f(x) & - & \vert & + & \vert & - & \vert & + \end{array} \longrightarrow [-4, 2] \cup [3, +\infty)$ ②

① ∩ ② $= [1, 2] \cup [3, +\infty)$

؟ ۴

$9x^4 - 7x^2 - 4x - 3 = (3x^2 + ax + b)(3x^2 + cx + d) \rightarrow 9x^4 - 7x^2 - 4x - 3 =$

$9x^4 + (3c + 3a)x^3 + (ac + 3d + 3b)x^2 + (ad + bc)x + bd$

$3c + 3a = 0 \quad c + a = 0 \quad c = -a$

$ac + 3d + 3b = -7$

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

$x(x^2+1) - \frac{4}{x}\left(\frac{16}{x^2} - 1\right) \geq 0 \qquad \begin{array}{ccccccccccc} & -4 & & -1 & & 0 & & 1 & & 4 & \\ - & \vert & + & \vert & - & \vert & + & \vert & - & \vert & + \end{array}$

$D_f = [-4, -1] \cup [0, 1] \cup [4, +\infty)$

$f(x^3+x) = 2x^2 - 1$ ۶

$\xrightarrow{x=1} f(2) = 2(1) - 1 = 1$

$\xrightarrow{x=2} f(10) = 2(4) - 1 = 7$

$f(2) + f(10) = 1 + 7 = \boxed{8}$

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

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

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

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

$\sqrt{x-4} + 2 + |\sqrt{x-4} - 2|$

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

$\xrightarrow{x > 4} \sqrt{x-4} + 2 - \sqrt{x-4} + 2 = 4$ ✗

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

$\to a + b = 2$

$\to x + c = x - 4$

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

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

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

الف) $f(2x) = [(\frac{1}{2}, 2), (\frac{3}{2}, -1), (2, 2), (-\frac{1}{2}, 6)]$ ۱۰

ب) $f(x^2) = [(\pm 1, 2), (\pm\sqrt{3}, -1), (\pm 2, 2), \cancel{(\text{غ.ق.ق}, 6)}]$

ج) $2g^2(x) + 1 = [(-2, 19), (1, 3), (3, 9), (-1, 1)]$

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

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