

تکلیف : 5

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

$$y = \sqrt{x^2 f(x+1)} \quad (5)$$

$$D_y = [0, 1]$$

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

$$x > -x \quad -2x+2 > 0 \quad x < 1 \quad x > 2$$

$$D_{f(x)} = (-\infty, 1] \quad \cup \quad [2, \infty)$$

$$y = \sqrt{x-1} \quad (1) \quad f(x) = \frac{x-1}{f(x)} \geq 0 \quad (2)$$

$$D_y = (-\infty, 1] \cup (2, \infty)$$

$$9x^2 - 7x^2 - 2x - 3 \neq 0 \quad 9x^2 - 7x^2 - 2x - 3$$

$$(3x^2-1)^2 = (x+2)^2 \rightarrow |3x^2-1| = |x+2|$$

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

$$\Delta = 1 - 4 \cdot 3 \cdot (-3) = 37$$

$$x_1, x_2 = \frac{1 \pm \sqrt{37}}{9} \Rightarrow R = \left\{ \frac{1 \pm \sqrt{37}}{9} \right\}$$

PARAMOUNT

$$\Delta = a^2 - 4b$$

$$-a \pm \sqrt{a^2 - 4b} = \frac{-1 \pm \sqrt{1 - 4(-3)}}{4}$$

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

$$y = \sqrt{f(x) - f\left(\frac{\varepsilon}{2}\right)}$$

$$f(x) = x^3 + x \quad (5)$$

$$x^3 + x - \frac{\varepsilon}{2} - \frac{4\varepsilon}{2} = \frac{x^3 + x - \varepsilon x^2 - 4\varepsilon}{2}$$

$$(x^3 - 4\varepsilon) + (x - \varepsilon x^2) = (x^3 - 1)(x^2 + 1) + x^2(x - \varepsilon)$$

$$(x-2)(x+2)(x^2 + 1) + x^2(x - \varepsilon) =$$

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$$D_y = [-2, 0) \cup [2, \infty)$$

$$f(2) + f(10)$$

$$f(x^3 + x) = 2x^2 - 1 \quad (6)$$

$$\frac{x^3 + x - 2}{x^3 + x} \cdot \frac{x-1}{x^2 + x + 1}$$

$$f(2) \rightarrow x=1$$

$$\frac{x^3 + x - 2}{x^3 + x}$$

$$\Delta < 0 \quad x^3 + x - 10 = 0 \quad x=2$$

$$f(2) + f(1) = 1 + 1 = 2 \quad (7)$$

$$f(x) = x^3 - 9x(x-2) - 1 + 1 = (x-2)^3 + 1 \quad (7)$$

$$g(x) = x^3 + 4x(x+3) + 27 - 27 = (x+3)^3 - 27$$

$$g(\sqrt[3]{27} - 3) = (\sqrt[3]{27})^3 - 27 = -27$$

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

$$f(x) = \sqrt{x + \epsilon} \sqrt{x - \epsilon} \quad g(x) = \sqrt{x - \epsilon} \sqrt{x + \epsilon} \quad (8)$$

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

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

$$g(x) = \sqrt{x - \epsilon} \sqrt{x + \epsilon} = |\sqrt{x - \epsilon} - \epsilon| \quad (f) = a + b\sqrt{x+c}$$

الحل
الممكن $\rightarrow \sqrt{x - \epsilon} = a + b\sqrt{x+c} \quad \begin{cases} a=0 \\ b=1 \\ c=-\epsilon \end{cases} \quad \frac{a+b}{c} = \frac{-1}{\epsilon} \quad (9)$

$$x^2 - \epsilon x + 1 \neq 0 \quad (x-1)(x-1) + 0 \quad (9)$$

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

$$f \cap g = \{(-1, 1)\}$$

$$\frac{g}{f} = \left\{ \left(-1, -\frac{1}{\epsilon} \right), (0, 1) \right\}$$

الف $f(x) = \left\{ \left(\frac{1}{2}, 2 \right), \left(\frac{3}{2}, -1 \right), (2, 2), \left(-\frac{1}{2}, 2 \right) \right\}$ (10)

ب $f(x) = \left\{ (1, 2), (-1, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2, 2), (-2, 2) \right\} \rightarrow \times$

ج $2g'(x) + 1 \left\{ (-2, 9), (1, 3), (3, 9), (-1, 3) \right\}$

$\rightarrow \frac{2f}{g} \left\{ (1, -2), (3, -1) \right\}$

$D_f \cap D_g = \{(-1, 3, 1)\}$