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پاسخنامه تشریحی تکلیف شماره ... ۱۹ ... کلاس ... پایه دهم ریاضی ...

$$f(x) = \left(\frac{1}{x}\right)^{x-1} - 1 \quad y = \sqrt{x^3 f(x+1)} \quad D_f = ?$$

$$x^3 f(x+1) \geq 0$$

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

$$x^3 \left(\left(\frac{1}{x+1}\right)^x - 1 \right) \geq 0 \quad \frac{0}{- \phi + \phi -} \quad D_f = [0, 1]$$

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

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

$$1) 2-x \geq 0 \Rightarrow x \leq 2 \Rightarrow 2-x+|2-x| = -x+2-x = -2x+2 \geq 0 \Rightarrow x \leq 1$$

$$2) 2-x < 0 \Rightarrow x > 2 \Rightarrow 2-x+|2-x| = -x-2+x = -2 \quad -2 > 2 \Rightarrow \text{غیر ممکن}$$

$$D_f = (-\infty, 1]$$

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$$g = \sqrt{\frac{x-1}{f(x)}} \quad \frac{x-1}{f(x)} \geq 0 \Rightarrow f(x) \neq 0 \Rightarrow x \neq -4, 2, 3$$

$$f(x) > 0 \Rightarrow x \in (2, 3) \cup (-\infty, -4)$$

$$f(x) < 0 \Rightarrow x \in (-4, 2)$$

$$\text{if } x > 1 \Rightarrow f(x) > 0 \text{ بل}$$

$$\text{if } x < 1 \Rightarrow f(x) < 0 \text{ نه}$$

$$D_g = [-4, 1] \cup (2, 3)$$

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$$y_1 = \frac{1}{9x^4 - 11x^2 - 4x - 3}, y_2 = \frac{1}{3x^2 + ax + b}, \sqrt{-(a+b)}$$

$$(3x^4 - x - 3)(3x^2 + x + 1)$$

$$\Delta < 0 \Rightarrow \text{دو ریشه مجزا}$$

$$\Rightarrow a = -1, b = -3$$

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

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$$f(x) = x^x + x \quad D_f = ? \Rightarrow y = \sqrt{f(x) - f\left(\frac{x}{x}\right)}$$

$$\frac{x^x + x}{1} - \frac{x}{x^x + x} \geq 0 \Rightarrow \frac{x^4 + 4x^3 + x^2 - x}{x^x + x} \geq 0 \Rightarrow (x+1)(x^3 - x^2 + 3x - 1) \geq 0$$

$$\Rightarrow \frac{(x+1)(x^3 - x^2 + 3x - 1)}{x(x^x + 1)} \geq 0 \Rightarrow [1, +\infty)$$

$$0 \leftarrow x(x^x + 1) \rightarrow \mathbb{R}$$

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

$$\frac{-1}{- \phi + \phi -} \quad \frac{0}{\phi + \phi -} \quad \frac{1}{- \phi + \phi +}$$

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$$f(x^v + x) = vx^v - 1 \quad f(v) + f(10) = ?$$

$$x = 1 \Rightarrow f(v) = 1$$

$$1 + v = \sqrt{1}$$

$$x = v \Rightarrow f(10) = v$$

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$$f(x) = \frac{x^3 - 4x^2 + 12x}{(x-1)^3 + 1}, g(x) = \frac{x^3 + 9x^2 + 27x}{(x+3)^3 - 27}, \frac{g(\sqrt[3]{v} - 3)}{f(\sqrt[3]{v} + 3)} = ?$$

$$\frac{(\sqrt[3]{v} - 3 + 3)^3 - 27}{v} = -20 \quad \frac{(\sqrt[3]{v} + 3 - 3)^3 + 1}{v} = 10 \Rightarrow \frac{-20}{10} = -2$$

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$$g(x) = \sqrt{x - f\sqrt{x-f}}, f(x) = \sqrt{x + f\sqrt{x-f}}, x \geq f$$

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

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

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

$$(\sqrt{x-f} + 1) + (\sqrt{x-f} - 1) = 2\sqrt{x-f} \quad \frac{a+b}{c} = \frac{2}{-f} = -\frac{2}{f}$$

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$$f(x) = \frac{x+2}{x^2 - 5x + 3}, g(x) = \{(2, 1), (1, 0), (3, 5), (0, 4)\}, \frac{g}{f} = ?$$

$$f(x) = \{(2, -f), (1, \frac{2}{f}), (3, \frac{5}{f}), (0, \frac{4}{f})\}$$

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

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$$f(x) = \{(1, \frac{1}{f}), (3, -\frac{1}{f}), (4, \frac{1}{f}), (-1, \frac{9}{f})\}, g(x) = \{(-2, 3), (1, -1), (3, 2), (-1, 0)\}$$

$$a) f(vx) = \{(\frac{1}{v}, v), (\frac{3}{v}, -v), (v, \frac{1}{v}), (-\frac{1}{v}, 9)\}$$

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

$$c) v g^v(x) + 1 = \{(-2, 3v), (1, 3v), (3, 9v), (-1, 0)\}$$

$$d) \frac{v f}{g} = \{(1, -\frac{f}{g}), (3, -\frac{1}{g}), (-\frac{1}{g}, \frac{9}{g})\}$$

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$$10. b) \begin{cases} x^r = 1 \rightarrow x = \pm 1 \\ x^r = v \rightarrow x = \pm \sqrt[r]{v} \\ x^r = f \rightarrow x = \pm \sqrt[r]{f} \\ x^r = -1 \rightarrow x \end{cases} \rightarrow \{(\pm 1, 1), (\pm \sqrt[r]{v}, -1), (\pm \sqrt[r]{f}, 1)\}$$