

$$f(x+1) = \left(\frac{1}{2}\right)^{x-1} \Rightarrow x^2 \times \left(\left(\frac{1}{2}\right)^{x-1} - 1\right) \geq 0$$

$$\Rightarrow x^2 \times \left(\left(\frac{1}{2}\right)^{x-1} - 1\right) = x^2 \times (2^{-x} \times 2 - 1) \geq 0 \Rightarrow x = < 1$$

$$\frac{0}{- \frac{1}{2} + \frac{1}{2} -} \Rightarrow Df = [0 \quad 1] \checkmark$$

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$$f(-x) = \begin{cases} \sqrt{-x + (x-2)} = \sqrt{-2} \propto x > 2 \\ \sqrt{-x + (-x+2)} = \sqrt{-2x+2} & x < 2 \end{cases}$$

$$\Rightarrow -2x + 2 \geq 0 \Rightarrow x \leq 1 \Rightarrow Df = (-\infty \quad 1] \checkmark$$

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$$\frac{x-1}{f(x)} \geq 0$$

$$\frac{-\frac{1}{2}}{-\frac{1}{2} + \frac{1}{2} - \frac{1}{2} + \frac{1}{2}} \Rightarrow Df = (-\frac{1}{2} \quad 1] \cup (2 \quad 3) \checkmark$$

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$$9x^4 - 17x^2 - 4x - 3 = (3x^2 + x + 1)(3x^2 - x - 3)$$

فاندیشن

$$\Rightarrow 3x^2 + ax + b = 3x^2 - x - 3 \Rightarrow a = -1 \checkmark b = -3 \checkmark$$

$$\Rightarrow a + b = -4 \Rightarrow \sqrt{-(a+b)} = \sqrt{4} = 2 \checkmark$$

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$$f(x) - f\left(\frac{x}{2}\right) \geq 0 \Rightarrow f(x) \geq f\left(\frac{x}{2}\right)$$

پاسخنامه...

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$$\text{if } x=2 \Rightarrow f(x) = f\left(\frac{x}{2}\right)$$

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بررسی درستی

$$\frac{-2 \quad -1 \quad 0}{+ \quad - \quad + \quad - \quad +} \Rightarrow Df = (-\infty \quad -2] \cup [-1 \quad 0) \cup [2 \quad +\infty)$$

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$$f(x) = f(1^x + 1) = x - 1 = 1 \checkmark$$

$$f(10) = f(1^x + x) = 1 - 1 = 0 \checkmark \Rightarrow f(x) + f(10) = 1 + 0 = 1 \text{ (2)}$$

$$f(x) = x^x - 9x^x + 12x = (x+3)^x - 2 \checkmark$$

$$g(x) = x^x + 9x^x + 2\sqrt{x} = (x-2)^x + 1$$

$$\Rightarrow \frac{g(\sqrt[3]{2} - 2)}{f(\sqrt[3]{2} + 2)} = \frac{(\sqrt[3]{2} - 2 + 3)^x - 2\sqrt{x}}{(\sqrt[3]{2} + 2 - 2)^x + 1} = \frac{1 - 2\sqrt{x}}{1 + 1} = -1 \checkmark \text{ (2)}$$

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

$$\sqrt{x-2}\sqrt{x-2} = \sqrt{(\sqrt{x-2}-2)^2} = |\sqrt{x-2}-2| = \sqrt{x-2}-2 \text{ (2)}$$

$$f(x) + g(x) = 2\sqrt{x-2} \Rightarrow a + b\sqrt{x+c} \Rightarrow a=0 \quad b=2 \quad c=-2$$

$$\Rightarrow \frac{a+b}{c} = \frac{0+2}{-2} = -1 \checkmark$$

$$f(x) = \frac{x+2}{x-1+x} = -2 \quad f(1) = \frac{1+2}{1-1+2} = \frac{3}{2} \text{ (2)}$$

$$f(x) = \frac{x+2}{9-12+x} = \frac{0}{0} \Rightarrow f(0) = \frac{2}{3}$$

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

$$\text{ا) } f(2x) = \left\{ \left(\frac{1}{2}, 2 \right), \left(\frac{3}{2}, -1 \right), (2, 2), \left(-\frac{1}{2}, 6 \right) \right\} \checkmark \text{ (2)}$$

$$\text{ب) } f(x^2) = \left\{ (1, 2), (-1, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2, 2), (-2, 2) \right\} \checkmark$$

$$\text{ج) } 2g^2(x) + 1 = \left\{ (-2, 19), (1, 3), (3, 9), (-1, 1) \right\} \checkmark$$

$$\text{د) } \frac{2f}{g} = \left\{ (1, -5), (3, -1) \right\} \checkmark$$