

* با عرض پوزش سوال ۱ و ۹ جابجایی شده است.

SUBJECT

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

$$x^3 + x = x(x^2 + 1) = 10 \quad \text{در } x=3 \rightarrow 2x^2 - 1 = 7 = f(10) \quad (2)$$

$$f(2) + f(10) = 11 \quad \checkmark$$

$$x^3 - 6x^2 + 12x = (x-2)^3 + 1 = x^3 - 6x^2 + 12x + 1 \Rightarrow f(\sqrt{x+2}) = 10 \quad \checkmark$$

$$x^3 + 9x^2 + 27x = (x+3)^3 - 27 = x^3 + 9x^2 + 27x - 27 \Rightarrow g(\sqrt{x-3}) = -10 \quad (2)$$

$$\frac{g(\sqrt{x-3})}{f(\sqrt{x+2})} = \frac{-10}{10} = -1 \quad \checkmark$$

$$f(x) = \frac{x}{-1} \quad f(1) = \frac{1}{0} \quad f(2) = \frac{2}{0} \quad f(0) = \frac{0}{2} \quad (2) \quad (9)$$

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

$$f(x) = \sqrt{(\sqrt{x-4} + 2)^2} = |\sqrt{x-4} + 2| = \sqrt{x-4} + 2 \quad (2) \quad (1)$$

$$g(x) = \sqrt{(\sqrt{x-4} - 2)^2} = |\sqrt{x-4} - 2| = \sqrt{x-4} - 2$$

$$f(x) + g(x) = 2\sqrt{x-4} \rightarrow a=0, b=2, c=-4 \rightarrow a+b = 2 \quad \checkmark$$

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

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

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

$$2f(x) = \left\{ (1, 4), (3, -2), (4, 4), (-1, 4) \right\}$$

$$\frac{2f}{g} = \left\{ (1, -\frac{4}{2}), (3, -\frac{2}{-1}), (-1, -\frac{4}{2}) \right\} \quad \checkmark$$