

نام و نام خانوادگی: آزمون ریاضی پاسخنامه تشریحی تکلیف شماره کلاس ۱۱۲ B

۲۰ آفریل ۱۱

$$D_{g \circ f} = \{x \in D_f, f(x) \in D_g\} : f(x) = \sqrt{\log_2(x-1)} \quad \begin{matrix} x-1 > 0 \Rightarrow x > 1 \\ \log_2(x-1) > 0 \Rightarrow x-1 \geq 2^0 \end{matrix} \quad \begin{matrix} 1 \rightarrow D_f = [1, \infty) \\ 2 \rightarrow D_g = [5, \infty) \end{matrix}$$

$$g(f(x)) = \sqrt{-\sqrt{2}(f(x)-1)} = g(x) = \sqrt{-(x-2)^2} = D_g = \{2\} : \sqrt{\log_2(x-1)} = 2 \Rightarrow \log_2(x-1) = 2^2 \Rightarrow x-1 = 2^4$$

$$x=17 \quad D_{g \circ f} = \{17\} \quad \checkmark$$

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$$f(x) = 2x - 5 \Rightarrow g(x) = x^2 - (2x - 5) + 11 \Rightarrow f \circ g(x) = f(x^2 - (2x - 5) + 11) = 2(x^2 - (2x - 5) + 11) - 5$$

$$g(f(x)) = g(2x - 5) = (2x - 5)^2 - 2(2x - 5) + 11 = 4x^2 - 20x + 25 - 4x + 10 + 11 = 4x^2 - 24x + 46$$

$$g \circ f(x) = f \circ g(x) = 4x^2 - 24x + 46 = 2x^2 - 6x + 11 \Rightarrow 2x^2 - 6x + 11 = 2x^2 - 6x + 11 \quad \checkmark$$

$$2x^2 + 12x = 5x^2 - 2x \Rightarrow 1.2 - 2 \times \frac{25}{4} = 1.0 - 25 = -24$$

$$S = 1.0 \quad D = 25$$

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$$g \circ f(x) = g(f(x)) = 5x^2 + 11, \quad f(x) = 6 - 4x \Rightarrow 5x^2 + 11 = \frac{5(6-4x)^2}{4} + 11 = g(x)$$

انتقال ضریب در برآیند با شری نبرد $R_{g(x)} \leftarrow R_{g(4-x)}$

$$g(f(x)) = \frac{5(6-4x)^2}{4} + 11 = \frac{5(36 - 48x + 16x^2)}{4} + 11 = \frac{45x^2 - 90x + 181}{4}$$

$$m_{\text{ext}} = \frac{-b}{a} = \frac{-(-90)}{45} = \frac{90}{45} = 2$$

$$5 \times 2^2 - 90 \times 2 + 181 = 20 - 180 + 181 = 21$$

$$\frac{f(x)}{g(x)} = 11 \quad \checkmark$$

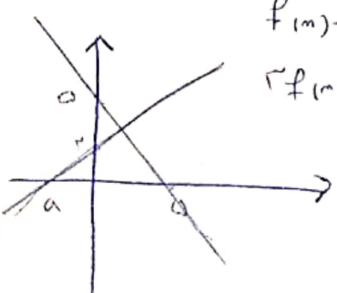
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$$f(x) = 2x - 2 : f(g(x)) = 2x^2 - 6x - 1 \Rightarrow 2y - 2 = 2x^2 - 6x - 1 \Rightarrow 2y = 2x^2 - 6x - 1 + 2 = 2x^2 - 6x + 1$$

$$f(y) = 2y - 2$$

$$g(f(x)) = (2x - 2)^2 - 2(2x - 2) + 1 = 4x^2 - 8x + 4 - 4x + 4 + 1 = 4x^2 - 12x + 9$$

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$$f(x) - g(x) = -x - 5 \Rightarrow 2f(x) - 2g(x) = -2x - 10$$

$$2f(x) - 2g(x) = 12 \Rightarrow 2f(x) - 2g(x) = 12$$

$$-f(x) = -2x - 5 \Rightarrow f(x) = 2x + 5$$

$$f(g(x)) = 2(2x - 1) + 5 = 4x - 2 + 5 = 4x + 3$$

$$-\frac{f}{a} = -\frac{5}{-1} \Rightarrow a = -5 \quad \checkmark$$

$$g(x) = 2x - 1$$

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$$f(m) = 9^m, g(m) = \log_9^m, f \circ g(m) = 9^{\log_9^m} = m^{\log_9^9} = m^1 = m$$

$$g \circ f(m) = \log_9^{9^m} = m$$

✓ $[0, 1]$ $\mathbb{R}$

$$f\left(\frac{m^r - r}{m}\right) = m^r + m - r - \frac{r}{m} + \frac{r}{m^r} = (m - \frac{r}{m})^r + m - \frac{r}{m} \rightarrow f\left(\frac{r}{m}\right) = \frac{r}{m} + m$$

✓ $\mathcal{P}(m) = m^r + m$ $\mathbb{Y}$

$$f(m) = \log_9^m, g(m) = 1 - m^r, f \circ g(m) = f(g(m)) = f(1 - m^r) = \log_9^{1 - m^r}$$

$$1 - m^r > 0 \rightarrow m(1 - m) > 0 \rightarrow \frac{1}{-1} < \frac{1}{1} \rightarrow \mathcal{P}_{\log} = (0, 1)$$

$$\frac{a-b}{c-a} = \frac{-1}{-r} = \frac{1}{r} \rightarrow 1 \times \frac{1}{r} = \frac{1}{r} \rightarrow \log_9^{\frac{1}{r}} = \frac{1}{r} \rightarrow \mathcal{P}_{\log} = \left(\frac{1}{r}, 1\right)^r$$

$$[0, 1] = (0, 1] \rightarrow \mathbb{R}$$

$\mathbb{A}$ $\mathbb{Y}$

$$h(m) = m^r + r(m+1), g(m) = m - r, f(f(m)) = 1 - r f(m) \rightarrow f(m) = 1 - r m^r$$

$$h(g(m)) = h(m - r) = (m - r)^r + r(m - r) + 1 = m^r - r m^r + r m - r^2$$

$$m^r - r m^r + r m - r^2 = -r m^r; m^r + r m - r^2 = 0 \rightarrow (r, 1) \text{ and } (r, 0) \text{ and } (0, 1)$$

✓

$\mathbb{Y}$

$$f(m) = m - \frac{r}{m}, g(f(m)) = 9 m^r + r m \rightarrow g\left(m - \frac{r}{m}\right) = 9 m^r + r m$$

$$\text{if } m = -1 \rightarrow g(r) = -9 - r = 1 \rightarrow m = -1$$

$$\text{if } m = r \rightarrow g(r) = 9 r^r + r = 1 \rightarrow m = 9$$

✓

$\mathbb{Y}$