

$$g(x) = \sqrt{-(x-2)^2} \Rightarrow D_f = 2$$

$$f(x) = \sqrt{\log_2(x-1)} \Rightarrow \log_2(x-1) \geq 0 \quad x-1 \geq 1 \Rightarrow x \geq 2$$

$$x-1 > 0 \quad x > 1$$

$$\sqrt{\log_2(x-1)} = 2 \Rightarrow \log_2(x-1) = 4 \Rightarrow x-1 = 16 \Rightarrow x = 17$$

$$2(x^2 - 2x + 1) - 5 = (2x - 5)^2 - 2(2x - 5) + 1$$

$$\Rightarrow 2x^2 - 4x + 2 - 5 = 4x^2 - 20x + 25 - 4x + 10 + 1 \Rightarrow 2x^2 - 4x - 3 = 0$$

$$ax^2 + bx + c = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\Rightarrow 1 \dots - 27 = 42$$

$$g \circ f = 5x^2 + 11 \Rightarrow f(x) = 2x \Rightarrow 2x = t \Rightarrow \frac{t}{2} = x$$

$$g(x) = 5\left(\frac{t}{2}\right)^2 + 11 = \frac{5t^2}{4} + 11 \Rightarrow R_g = [11, +\infty)$$

$$\Rightarrow g(x-2) = \frac{5}{4}(x-2)^2 + 11 = \frac{5}{4}x^2 - 5x + 15$$

انتقال قطبی تابعی در بردار رسیده

$$x_{\min} = \frac{-b}{2a} = 2 \Rightarrow y_{\min} = 15 \quad R_{g(x-2)} = [15, +\infty)$$

$$f(g(x)) = 2(g(x) - 2) = 2x^2 - 4x - 1$$

$$2(g(x)) = 2x^2 - 4x + 2 \Rightarrow g(x) = x^2 - 2x + 1$$

$$g \circ f = g(f(x)) = (2x - 2)^2 - 2(2x - 2) + 1$$

$$= 4x^2 - 8x + 4 - 4x + 4 + 1$$

$$f - g = -x + 5 \Rightarrow f = 2x + 5$$

$$2g - 2f = -15 \quad g = 2x - 1$$

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

$$4x + 3 = 0 \Rightarrow x = -\frac{3}{4}$$

$$f \circ g \leq g \circ f \rightarrow q \log_p^n \leq \log_p^{qn}$$

$$\rightarrow n^r \leq rn \rightarrow n^r - rn \leq 0$$

$$\begin{array}{c} 0 & r \\ +1 & -1 \end{array} \rightarrow n^r - rn \leq 0$$

$$\rightarrow (0, r] \quad \checkmark$$

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$$f(n) = n^r + n \quad \checkmark$$

$$f\left(\frac{n^r - r}{n}\right) = \left(n - \frac{r}{n}\right) + n^r + \frac{\varepsilon}{n^r} - r$$

$$\left(\frac{n^r - r}{n}\right)^r = \frac{n^r - \varepsilon n + \varepsilon}{n^r} \quad \checkmark$$

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$$f \circ g = \log \frac{\Lambda n - n^r}{r} \quad \Lambda n - n^r > 0 \quad (0, \Lambda)$$

$$\begin{array}{c} 0 & \Lambda \\ -1 & +1 \end{array}$$

$$R_g = (-\infty, 14] \xrightarrow{\log^n} (-\infty, \varepsilon]$$

$$f - g = [-\infty, 14] \rightarrow (0, r]$$

$$R_{f \circ g} = (-\infty, \varepsilon]$$

$$(0, \Lambda) \cap (0, r] \rightarrow (0, r]$$

$$A \cap B = (0, \varepsilon] \quad \text{max } \varepsilon$$

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$$f(g(n)) = 1 - r f(n)^r \rightarrow f(n) = 1 - r n^r$$

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

$$n^r - r n^r - r n^r - 1 + r n - r + 1 = 1 - r n^r$$

$$n^r + a n - r = 0$$

$$\checkmark$$

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$$g(r) = \Lambda$$

$$\begin{cases} g(f(n)) = g(r) = \Lambda \\ f(n) = r \end{cases}$$

$$x - \frac{r}{x} = r \rightarrow x^r - r x - r = 0$$

$$(x+1)(x-r) = 0$$

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$$x = -1 \rightarrow \Lambda = a(-1)^r + r(-1)$$

$$= -a - r = \Lambda \rightarrow \underline{a = -10}$$

$$\left. \begin{array}{l} a(4\varepsilon) + \Lambda = \Lambda \\ \rightarrow a = 0 \end{array} \right\}$$

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