

$$D_{f(a)} = [-4, \omega]$$

$$a f(a) \gg 0 \rightarrow a \gg 0$$

$$D_{a f(a)} = [0, +\infty) \cap [-4, \omega] = [0, \omega]$$

مقیاس

$$\sqrt{\frac{-a}{f(a)}} \left\{ \begin{array}{l} a = 0 \\ a = 2 \\ a = \omega \\ a = -2 \end{array} \right.$$

$-2 \quad 0 \quad 2 \quad \omega$

$- \oplus + \oplus - \oplus$

$$D_f = (-2, 0) \cup (0, 2)$$

$$n = -2, -1, 1 \Rightarrow n = 3$$

دارای ۳ صغیر است

$$a = 2 \rightarrow f(2) - 2f(2) = 2 \Rightarrow -f(2) = 2 \rightarrow f(2) = -2$$

$$a = -2 \rightarrow f(-2) - 2(-2) = 2 + 4 + 2 = 12$$

$$f(-2) + 2 = 12 \rightarrow f(-2) = 10$$

$$f(\omega) = \omega - \sqrt{a} = 2 \Rightarrow f(f(\omega)) = f(2) = 2$$

$$f(1) = \omega \rightarrow f(f(1)) = f(\omega) = 2$$

$$f(f(\omega)) + f(f(1)) = 2 + 2 = 4$$

$$a(a-1)^2 - b(a-1) - a a^2 + b a - 2 = a(a^2 - 2a + 1) - b(a-1) - a a^2 + b a = a a^2 - 2a^2 + a - b a + b - a a^2 + b a \Rightarrow -2a^2 + a + b = 4a + 2$$

$$-2a = 4 \rightarrow a = -2$$

$$a + b = 2 \rightarrow b = 4$$

$$a - b = -2 - 4 = -6$$

$$f(n) = \frac{n^2 + (n+2) + 1}{n^2 + (n+2) + 1} = \frac{(n+2)^2 + 1}{(n+2)^2 + 1} \Rightarrow n = \sqrt{3} - 2$$

$$f(\sqrt{3} - 2) = \frac{(\sqrt{3} - 2 + 2)^2 + 1}{(\sqrt{3} - 2 + 2)^2 + 1} = \frac{2}{4} = \frac{1}{2}$$

$$f\left(n - \frac{1}{n}\right) = n^2 + \frac{1}{n^2} \xrightarrow{+2, -2} f\left(n - \frac{1}{n}\right) = n^2 + \frac{1}{n^2} \Rightarrow 2 + 2$$

$$f\left(n - \frac{1}{n}\right) = \left(n - \frac{1}{n}\right)^2 + 2 \Rightarrow n - \frac{1}{n} = -2 \Rightarrow f(-2) = (-2)^2 + 2 = 6$$

$$f(-2) = 4 + 2 = 6$$

$$D_f = \{2, 1, 0, 1\}, D_g = \{x \mid x \leq 3\} = [-3, 3]$$

$$D_f \cap D_g = \{0, 1, 2\} \Rightarrow g(0) = \sqrt{9-0} = \sqrt{9} = 3, g(1) = \sqrt{8}$$

$$g(x) = \sqrt{9-x} \Rightarrow \frac{f}{g} = \left\{ \left(0, \frac{2}{3}\right), \left(1, -\sqrt{2}\right), \left(2, 0\right) \right\}$$

$$\frac{g}{f} = \left\{ \left(0, \frac{3}{2}\right), \left(1, \frac{2\sqrt{2}}{-2}\right), \left(2, \frac{0}{-2}\right) \right\} = \left\{ \left(0, \frac{3}{2}\right), \left(1, -\sqrt{2}\right) \right\}$$

$$f^2(n) = \{(2, 2), (3, 8), (-5, 4), (1, -4)\}$$

$$f(n) + 1 = \{(2, 2), (3, 6), (-5, 3), (1, -1)\}$$

$$f^2(n) + 1 = \{(2, 4), (3, 19), (-5, 13), (1, 13)\}$$

$$f(2n) = \left\{ \left(1, 1\right), \left(\frac{3}{2}, 2\right), \left(-\frac{5}{2}, 2\right), \left(\frac{1}{2}, -2\right) \right\}$$

الف) در این حالت باید درایه های دوم را از هم کم کنیم

$$D_f \cap D_g = \{1, 2, 3\} \Rightarrow f-g = \{(2, 2), (3, 2), (1, 4)\}$$

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