

$$y = \sqrt{f(n) - n + 1} \quad f(n) = \begin{cases} n-1; [n], x \rightarrow n, \omega \\ f_{n+1}; [n], x \rightarrow n < \omega \end{cases}$$

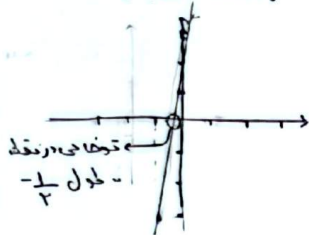
$$f(n) - n + 1 \geq 0 \xrightarrow{n > \omega} n-1-n+1 \geq 0 \Rightarrow n \geq 0; n > \omega \Rightarrow D = [\omega, +\infty) \quad I$$

$$\xrightarrow{n < \omega} f_{n+1} - n + 1 \geq 0 \Rightarrow f_{n+1} \geq n-1; n < \omega \Rightarrow D = [-\frac{f}{r}, \omega) \quad II$$

$$I \cup II \Rightarrow D_f = [-\frac{f}{r}, +\infty)$$

$$y = \frac{r + n^2 + 4n + 1}{(f_{n+1} - f_n)^2} = \frac{r(1 + n^2 + 4n + 1)}{(f_{n+1} - f_n)^2} = \frac{r(2n+1)^2}{(f_{n+1} - f_n)^2} = \frac{r(2n+1)}{f_{n+1} - f_n} = \frac{r(2n+1)}{9n+3}$$

$$D_f = \mathbb{R} - \{-\frac{1}{r}\}$$



$$f(n) = \begin{cases} \frac{n^2 + 4n + 1}{n^2 - 1}; n \neq \pm 1 \\ \frac{a+r}{n+b}; n = \pm 1 \end{cases}, \quad g(n) = n + C$$

$$n=0 \rightarrow g(n) = f(n) \rightarrow C = \frac{-r}{-1} = r$$

$$n=1 \rightarrow \frac{a+r}{1+b} = 1+r \rightarrow a+r = 1+r+b$$

$$r+b-a = 1$$

$$n=-1 \rightarrow \frac{-a+r}{-1+b} = -1+r \rightarrow -a+r = -1+b$$

$$b+a = r$$

$$r+b = r \rightarrow b = \frac{1}{r}$$

$$b+C = \frac{r}{r}$$

$$f(n) = \frac{n+1}{n-C} \quad g(n) = \frac{n^2-1}{n^2+a+b} = \frac{(n+1)(n-1)}{n^2+a+b}$$

$$\frac{n+1}{n-C} = \frac{(n+1)(n-1)}{n^2+a+b} \Rightarrow \frac{n+1}{n-C} = \frac{n-1}{n-1} = \frac{n-1}{n-1}$$

فرض کنیم $f(n)$ تنها یک دارد و این را داریم به دست می آوریم. فرض کنیم $g(n)$ ضابطه C را دارد از طرف دیگر $g(n)$ باید عامل اضافی $n-1$ از صورت حذف شود پس باید این عامل در مخرج وجود داشته باشد تا امکان ساده کردن و برابری دافعه و ضابطه بوجود بیاید.

$$\Rightarrow a = -r \quad b = 1 \quad C = 1$$

$$a+b+C = 0$$

$$f(n) = (n-r)^2(n+1), \quad g(n) = f(n+1), \quad f(1-n) = ?$$

$$f(n+1) = (n-r)^2 n \quad f(1-n) = -n(-n-r)^2 = -n(n+r)^2$$

$$g(n) = n(n-r)^2 - n(n+r)^2 = n[(n-r)^2 - (n+r)^2] = n(-4nr) = -4n^2r$$

$$f(1-2n) = \begin{cases} \sqrt{n} + 1 & n \leq 0 \\ \sqrt{n} & n > 0 \end{cases} \quad f(-1) + f(3)$$

$$1-2n = -1 \rightarrow n=1 \Rightarrow \sqrt{1} = 1 = f(-1)$$

$$\rightarrow f(-1) + f(3) = 1 + 1 = 2$$

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

$$f(n \cdot \sqrt{n}) = n^{\frac{1}{2}} \cdot \sqrt{n}$$

سوال (5) <

$$n + \sqrt{n} = 9 \rightarrow \sqrt{n} \cdot 9 - n \xrightarrow{n > 0} \begin{matrix} 9 - n > 0 \\ 9 > n \end{matrix}$$

$$n = 39 + 2 \cdot 19n$$

$$n^2 - 19n + 39 \cdot 0 \rightarrow (n-9)(n-4) = 0$$

$$\frac{n=9}{n=4}$$

یا در تابعی مشتق حساب کرد

$$n=4 \rightarrow f(4) = \sqrt{4} + 19 = 204 + 19 = 223$$

$$f(n) = n^{\frac{1}{2}} + n \quad f(n-1) + f(1-n)$$

سوال (6) <

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

$$\rightarrow f(n-1) + f(1-n) = 0$$

$$f(1-n) = f(-(n-1)) = -f(n-1) = -(n-1)^{\frac{1}{2}} - (n-1)$$

$$f(n) = \sqrt{n-a} + k-1, \quad g(n) = \sqrt{b-n} + 3k, \quad \forall f=g: \{(1, k)\}, \quad 3a - \frac{b}{3} - k = ?$$

سوال (7) <

$$D_f = f(n-a) \geq 0 \rightarrow n \geq \frac{3a}{3}$$

$$D_g = b-f(n) \geq 0 \quad n \leq \frac{b}{3}$$

$$\Rightarrow D_g \cap D_f = \{1\} \rightarrow \frac{3a}{3} = \frac{b}{3} = 1 \rightarrow a = \frac{3}{3}, b = 3$$

$$\forall f(1) = g(1) = k \rightarrow (\sqrt{f(1)-a} + k-1) - (\sqrt{b-f(1)} + 3k) = k \rightarrow 1k - 1 - 3k = k \rightarrow \frac{-2k}{k=-1} = 2$$

$$3a - \frac{b}{3} - k = 3\left(\frac{3}{3}\right) - \left(\frac{3}{3}\right) - (-1) = 3$$

$$f(n) = \sqrt{m-n} + n, \quad g(n) = \sqrt{m+n} \quad D_{f \cap g} = [-1, v], \quad f-g(3) = 4\sqrt{2}$$

سوال (8) <

$$\left. \begin{array}{l} D_f = m-n \geq 0, \quad n \leq m \\ D_g = m+n \geq 0, \quad n \geq -1 \end{array} \right\} \xrightarrow{n} [-1, v] \Rightarrow m = v$$

$$f(3) - g(3) = 4\sqrt{2} \rightarrow \sqrt{v-3} + 3 - \sqrt{v+3} = 4\sqrt{2}$$

$$3+n - 2\sqrt{2} = 4\sqrt{2}$$

$$n = 4\sqrt{2} - 3$$

$$m+n = 4\sqrt{2} + \omega$$