

$$f(n) = \begin{cases} r_{n-1} & n \geq 0 \\ r_{n+1} & n < 0 \end{cases} \quad \text{و } g = \begin{cases} \sqrt{r_{n-1} - n + 1} & n \geq 0 \\ \sqrt{r_{n+1} - n + 1} & n < 0 \end{cases} \quad \text{و } \begin{cases} g = \sqrt{n} & n \geq 0 \\ g = \sqrt{r_{n+1}} & n < 0 \end{cases}$$

ضابطه اول $(a > 0 \wedge n \geq 0) \vee (n \geq \omega)$ (۳)

ضابطه دوم $r_{n+1} \geq 0 \Rightarrow (a \geq -\frac{r}{r}) \wedge n < 0 \Rightarrow -\frac{r}{r} \leq n < 0$ (۴)

(۲) $\cup$ (۴) $\Rightarrow -\frac{r}{r} \leq n$

$Df = [-\frac{r}{r}, +\infty)$ ✓

$$\frac{r^2(na^r + r_{n+1}^r + r_{n+1})}{(r_{n+1} + r_{n+1})^r} = \frac{r^2(n+1)}{(r_{n+1})^r} = \frac{r}{r_{n+1}} \Rightarrow Df = \{r\} \quad (۲) - r$$

$r_{n+1} \neq 0 \Rightarrow n \neq -\frac{1}{r}$

$$f(a) = \begin{cases} \frac{a^r + r_{n+1}^r - a - r}{a^r - 1} & a \neq \pm 1 \\ \frac{a_{n+1} + r}{a + b} & a = \pm 1 \end{cases} \quad \text{و } g(a) = \frac{a^r(n+1) - (n+1)}{(a^r - 1)} = \frac{(n+1)(a^r - 1)}{(a^r - 1)} = n+1$$

$a + r = a + c \Rightarrow c = r$

$b + c = \frac{1}{r} + r = r/w$ ✓

۱) $a = 1 \Rightarrow 1 + r = \frac{a + r}{a + b} = \frac{a + r}{1 + b} = r \Rightarrow a + r = r + rb \Rightarrow a - rb = 1$

۲) $a = -1 \Rightarrow -1 + r = \frac{a + r}{a + b} = \frac{-a + r}{b - 1} = 1 \Rightarrow b - 1 = -a + r \Rightarrow a + b = r$

$b = r \Rightarrow b = \frac{1}{r}$ ✓
 $a = r/w$ ✓

$f(a) = a + c$ (۲) و $g(a) = a + c$ (۲) و $c = r$ (۲)

$\lim_{n \rightarrow +1} \frac{a^r + r_{n+1}^r - a - r}{a^r - 1} = \frac{0}{0} \quad \text{h.p} \quad \frac{r a^r + r_{n+1} - a - 1}{r a} = \frac{r - 1}{r} \quad (۳) \quad f(1) = r \Rightarrow g(1) = r \Rightarrow a + c = r$

$\lim_{n \rightarrow -1} \frac{a^r + r_{n+1}^r - a - r}{a^r - 1} = \frac{0}{0} \quad \text{h.p} \quad \frac{r a^r + r_{n+1} - a - 1}{r a} = \frac{-r}{-r} \quad (۱) \quad f(-1) = 1$

$f(1) = \frac{a + r}{1 + b} = r \quad r + r_b = r + a$

$f(-1) = \frac{-a + r}{b - 1} = 1 \quad b - 1 = -a + r$

$c = r$ ✓
 $b + r = \frac{1}{r} + r = r/w$ ✓
 $b = r \Rightarrow b = \frac{1}{r}$ ✓
 $a = r/w$ ✓

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

$$a+b+c = -1+1+1 = 1$$

(2)

$$g(n) = \frac{(n-1)(n+1)}{n^2+4n+b}$$

چون تابع f کامل
ا. ا. در صورت ظاهر

پس متوجه تابع (n-1) دارم

که ساده تر از (n-1) است. بنابراین (n-1) متوجه تابع f می شود و در صورت
دیده می شود که برای تمام n است.

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

$$f(n) = \frac{n+1}{n-1} \Rightarrow c = 1$$

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

$$a = 1, b = 1$$

$$f(n+1) = (n-1)^2(n) = (n^2-2n+1)n = n^3-2n^2+n \quad (1)$$

(2)

~~$$f(n) = (n-1)^2(n) = (n^2-2n+1)n = n^3-2n^2+n$$~~

$$f(n) = (-n-1)^2(-n) = (n^2+2n+1)(-n) = -n^3-2n^2-n \quad (2)$$

$$(1) + (2) = n^3-2n^2+n - n^3-2n^2-n = -4n^2$$

$$1-2n=2 \Rightarrow n=-1 \Rightarrow f(2) = -1+2+1 = 2$$

$$1-2n=-1 \Rightarrow n=1 \Rightarrow f(-1) = 1$$

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

(2)

$$f(n+5n) = n^2+n^2 = 2n^2 \quad n+5n=6 \Rightarrow n=1$$

$$f(6) = 1^2+1^2 = 2$$

(2)

$$f(n-1) + f(1-n)$$

$$f(n) = n^2 + a$$

سیریلی فی مان ارا - ۸

(۲)

$$h-1=t \quad f(t) + f(-t)$$

$$f(t) = t^2 + t$$

$$f(-t) = -t^2 - t$$

$$\Rightarrow f(t) + f(-t) = 0 \quad \checkmark$$

دقیقاً $\{f(k)\}$ و $2f-g$
شده یعنی انتگرال داشته باشند
فقط $\{1\}$ به بر
یعنی دامنه $[1, +\infty)$ درستی
دارد $[-\infty, 1]$

$$f(n) = \sqrt{f_n - f_a + k - 1}$$

$$D(f) = \left[\frac{f_a}{f} + \infty \right) \Rightarrow \frac{f_a}{f} > 1 \Rightarrow a = \frac{f}{f} \quad \checkmark$$

$$g(n) = \sqrt{b - f_n + k}$$

$$D(g) = (-\infty, \frac{b}{f}] \Rightarrow \frac{b}{f} > 1 \Rightarrow b = f \quad \checkmark$$

$$f(n) = \sqrt{f_n - f + k - 1}$$

$$g(n) = \sqrt{f - f_n + k}$$

$$2f - g = 2(k-1) - k = -k - 2 = k \Rightarrow k = -2 \Rightarrow k = -1 \quad \checkmark$$

$$f_a - \frac{b}{f} - k = \frac{f}{f} - \frac{f}{f} + 1 = f - 2 + 1 = f - 1 \quad \checkmark$$

$$D_{f \times g} = [-1, v] \Rightarrow D_f \cap D_g = [-1, v] \Rightarrow D_g = [-1, +\infty) \quad \checkmark - 1$$

$$D_f = (-\infty, v]$$

$$D_f = (-\infty, m] \Rightarrow m = v \quad \checkmark$$

$$f(n) = \sqrt{v - n} + n$$

$$g(n) = \sqrt{2n + 2}$$

$$f(v) = \sqrt{f + h} = v + h$$

$$g(v) = \sqrt{n} = v\sqrt{2}$$

$$v + h - v\sqrt{2} = v\sqrt{2} \Rightarrow v + h = 2v\sqrt{2} \Rightarrow h = v(\sqrt{2} - 1) \quad \checkmark$$

~~Handwritten scribbles and crossed-out text.~~

$$m + h = v + \sqrt{2}v - v = v\sqrt{2} \quad \checkmark$$