

$$f(n) = \begin{cases} n-1 & ; [n] > r \\ n+r & ; [n] \leq r \end{cases} \quad \gamma, \sqrt{f(n)-n+1}$$

$$[n] > r \rightarrow n > 0 \rightarrow \sqrt{n-1-n+1} = \sqrt{0} = 0 \Rightarrow n > r \Rightarrow n > 0$$

$$[n] \leq r \rightarrow n < 0 \rightarrow \sqrt{n+r-n+1} = \sqrt{r+1} \Rightarrow n < 0 \rightarrow n+r > 0$$

$$n > -\frac{r}{r} \Rightarrow \frac{-r}{r} \leq n < 0$$

$$Df = \left[\frac{-r}{r}, +\infty \right)$$

$$\gamma = \frac{r(n^r + r n^{r-1} + 1)(n+r)}{(n^r + r n^{r-1})^r} = \frac{r(1 + r n + 1)(n+r)}{(n+r)^r} = \frac{r(n+r)}{(n+r)^r}$$

$$\frac{r}{n+r} = \gamma \rightarrow n+r \neq 0 \rightarrow n \neq -\frac{r}{r} \rightarrow Df = \mathbb{R} - \left\{ -\frac{r}{r} \right\}$$

$$f(n) = \begin{cases} \frac{n^r + r n^{r-1} - n - r}{n^{r-1}} & n \neq \pm 1 \\ \frac{n+r}{n+b} & n = \pm 1 \end{cases} = g(n), n \in \mathbb{C} \quad \boxed{b+r = r + \frac{1}{r} + r + 1}$$

$$n^r + r n^{r-1} - n - r \rightarrow \frac{n^r + r n^{r-1} - n - r}{(n-1)} \rightarrow \frac{(n-1)(n+1)(n+r)}{(n-1)(n-1)} = n+1 = n+c$$

$$g(1), r+1 \leq r \rightarrow \frac{a+r}{1+b} \leq r \rightarrow r b + r a + r g \quad g(-1) \leq 1 \Rightarrow \frac{r-a}{b-1} \leq 1$$

$$b-1 \leq r a \quad \rightarrow b \leq \frac{1}{r} + a \leq r + 1$$

$$f(n) = \frac{n+r}{n-c} \quad g(n) = \frac{n^r-1}{n^r+a n+b} = \frac{(n+1)(n-1)}{n^r+a n+b} \rightarrow \frac{(n-1)^r}{n^r+a n+b} \rightarrow \frac{(n-1)^r}{(n-1)^r} = \frac{(n-1)^r}{(n-1)^r}$$

$$n^r+a n+b, (n-1)^r \rightarrow \text{جزاین بود (این) با هم مقادیر بود و دیگر برابر}$$

$$(n-1), (n-c) \rightarrow c \leq 1 \quad a+b+c = 1+r-r = 1$$

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

$$f(1-n) = (-n-r)^r (-n) = -(n+r)^r (n)$$

$$g(n) = (n-r)^r (n) - (n+r)^r (n) = n(n^r + r^r - n^r - r^r) = -n^r$$

$f(1-t), \begin{cases} \sqrt{t} + t & t \leq 0 \\ \sqrt{t} & t > 0 \end{cases}$ $f(t) \rightarrow 1-t, t \rightarrow 0 \rightarrow 1 \rightarrow \sqrt{1} = 1$ $f(t) \rightarrow 1-t, t \rightarrow 1 \rightarrow 0 \rightarrow \sqrt{0} = 0$ $f(1) + f(0) = 1 + 0 = 1$	6
$f(m + \sqrt{n}) = m^2 + n$ $m + \sqrt{n} = 4 \rightarrow t^2 + t - 4 = 0$ $t = \sqrt{n}$ $m^2 + n = m^2 + t^2 \rightarrow t^2 + t - 4 = 0$ $t = 1 \rightarrow \sqrt{n} = 1 \rightarrow n = 1$	7
$f(m-1) + f(1-m) = f(m) = m^2 + m$ $(m-1)^2 + (m-1) + (1-m)^2 + (1-m) = 0$ $m-1 + 1-m = 0$	8
$f(m) = \sqrt{m-a} + k-1$ $g(m) = \sqrt{b-m} + k$ $f-g = 0 \Rightarrow \sqrt{m-a} + k-1 = \sqrt{b-m} + k$ $\sqrt{m-a} - \sqrt{b-m} = 1$ $m-a \geq 0 \Rightarrow m \geq a$ $b-m \geq 0 \Rightarrow m \leq b$ $a \leq m \leq b$ $b-a \geq 1$	9
$f(m) = \sqrt{m-a} + k$ $g(m) = \sqrt{b-m} + k$ $f-g = 0 \Rightarrow \sqrt{m-a} = \sqrt{b-m}$ $m-a = b-m$ $2m = a+b$ $m = \frac{a+b}{2}$	10