

$$y = \sqrt{f(x) - x + 1} \quad (1)$$

$\begin{cases} [x] > f \rightarrow x-1 \xrightarrow{y} \sqrt{x-1-x+1} = \sqrt{0} \rightarrow \sqrt{0} \text{ مدون} \\ [x] \leq f \rightarrow x+f \xrightarrow{y} \sqrt{x+f-x+1} = \sqrt{f+1} \rightarrow \sqrt{f+1} \geq 0 \rightarrow x \geq -\frac{f}{1} \end{cases}$

$$D_y = [-\frac{f}{1}, +\infty)$$

$$y = \frac{f^2 x^3 + f^2 x^2 + 11x + 3}{(x^2 + f^2 + 1)^2} = \frac{3(1x^3 + 12x^2 + 11x + 3)}{(x^2 + 1)^2} = \frac{3(x+1)^3}{(x^2 + 1)^2} \quad (2)$$

$$x+1 \neq 0 \rightarrow x \neq -1 \rightarrow D_y = \mathbb{R} - \{-1\}$$

$$h(x) = \begin{cases} \frac{x^3 + 2x^2 - x - 2}{x^2 - 1}, & x \neq \pm 1 \\ \frac{ax + r}{x + b}, & x = \pm 1 \end{cases} \quad (3)$$

$\begin{matrix} x \neq \pm 1 \\ \downarrow \text{سازگار} \end{matrix} \quad \begin{matrix} x=1 \rightarrow \frac{a+r}{b+1} \\ x=-1 \rightarrow \frac{r-a}{b-1} \end{matrix}$

$$g(x) = x + c \quad (4)$$

$\begin{cases} x=1 \rightarrow c = 1 \\ x=1 \rightarrow c+1 = 3 \\ x=-1 \rightarrow 1 \end{cases}$

$$\begin{aligned} x=1 \rightarrow \frac{a+r}{b+1} &= 3 \rightarrow \begin{cases} a+r = 3b+3 \\ r-a = b-1 \end{cases} \\ x=-1 \rightarrow \frac{r-a}{b-1} &= 1 \rightarrow \begin{cases} r-a = b-1 \\ r = b+1 \end{cases} \end{aligned}$$

$r = b+1 \rightarrow b = \frac{1}{1} \quad (5)$

$$b+c = \frac{1}{1} + 1 = 2 \quad (6)$$

$$h(x) = g(x) \rightarrow \frac{(x+1)}{x-c} = \frac{(x+1)(x-1)}{x^2 + ax + b} \quad (7)$$

$\hookrightarrow D_h = D_g$

$\begin{matrix} \S \\ x \neq c \end{matrix} \quad \begin{matrix} \S \\ x^2 + ax + b = 0 \rightarrow \text{ریشه ها} \end{matrix}$

$c = 1$

$$a+b+c = 0 \quad (8)$$

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

$$h(x) = (x-1)^2(x+1) \quad g(x) = h(x+1) + h(1-x) \quad (9)$$

$$h(x+1) = (x+1)^2(2) = x^2 + 4x + 2 \quad \rightarrow \quad -x^2 = g(x)$$

$$h(1-x) = (-x)^2(-2) = -x^2 - 2x$$

$$h(1-n) = \begin{cases} \sqrt[n]{n} + 1, & n \leq 0 \\ 1 + \sqrt[n]{n}, & n > 0 \end{cases} \quad h(-1) + h(1) = 2 \quad (2) \text{ (9)}$$

$1 - \sqrt[n]{n} = -1 \sim n = 1 \rightarrow h(-1) = 1$
 $1 - \sqrt[n]{n} = 1 \sim n = -1 \rightarrow h(1) = 1$

$$h(n + \sqrt[n]{n}) = n^2 + \sqrt[n]{n} \quad n + \sqrt[n]{n} = 9 \rightarrow t^2 + t - 9 = 0 \quad (2) \text{ (V)}$$

$\rightarrow (t+3)(t-1) = 0$
 $\downarrow$
 $\text{جواب } t = -3$
 $\hookrightarrow t = 2 \rightarrow n = 4 \rightarrow h(4) = (4)^2 + \sqrt[4]{4} = 16 + 2 = 18$

$$h(n) = n^2 + n \quad h(n+1) + h(1-n) = 0 \quad \leftarrow (2) \text{ (A)}$$

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

$$h(n) = \sqrt[n]{n-a} + k - 1 \quad \forall h-g = \{(1, k)\} \quad (2) \text{ (9)}$$

$$g(n) = \sqrt[n]{b - \frac{1}{n}} + \frac{1}{n} k$$

$\hookrightarrow \frac{1}{n} a - \frac{1}{n} b - k = ?$

$$D_h \cap D_g = \{1\} \xrightarrow{\text{جواب}} D_g (-\infty, 1] \rightarrow D_h [1, +\infty)$$

$$n - \frac{1}{n} a \geq 0 \quad \frac{1}{-b+} \quad a = \frac{1}{n}$$

$$b - \frac{1}{n} \geq 0 \quad \frac{1}{+b-} \quad b = \frac{1}{n}$$

$$h(1) = 1(\sqrt[1]{1-a} + k - 1) \quad , \quad g(1) = \sqrt[1]{b - \frac{1}{1}} + \frac{1}{1} k \rightarrow 1k - 1 - 1k = k$$

$k = 1$

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

$$g(n) = \sqrt[n]{n+1} \quad h(n) = \sqrt[n]{n} + n \quad D_{h \times g} = [-1, 1] \quad (2) \text{ (10)}$$

$D_g = [-1, +\infty)$
 $\hookrightarrow D_h = (-\infty, 1] \rightarrow m = 1$

$$h(g(n)) = 1 + \sqrt[n]{n+1} \quad \rightarrow \quad 1 + n = 1 + \sqrt[n]{n+1} \quad \rightarrow \quad n = 1 + \sqrt[n]{n+1}$$

$g(1) = 1 + \sqrt[1]{1} = 2$
 $h(2) = 1 + \sqrt[2]{2} = 1 + \sqrt{2}$
 $m + n = 1 + \sqrt{2}$