

آریتھمیتیک

شماره ۳: کتب

آریتھمیتیک

$$f(n) = \begin{cases} 2n-1 & ; [n] > 3 \\ 2n+3 & ; [n] \leq 3 \end{cases}$$

$$f(n) = \begin{cases} 2n-1 & ; n \geq \omega \\ 2n+3 & ; n < \omega \end{cases}$$

$$y = \sqrt{f(n) - n + 1} \geq 0$$

(1)

$$2n-1-n+1 \geq 0 \quad ; \quad n \geq \omega \xrightarrow{1} n \geq \omega \textcircled{1}$$

$$2n+3-n+1 \geq 0 \quad ; \quad n < \omega \xrightarrow{1} 2n+4 \geq 0 \textcircled{2}$$

$$102 \rightarrow D_f =$$

$$[-\frac{1}{2}, +\infty)$$

$$y = \frac{3(2n^3 + 12n^2 + 9n + 1)}{(2n^2 + 2n + 1)^2} = \frac{3(2n+1)^3}{(2n+1)^4} = \frac{3}{2n+1} \xrightarrow{\text{در اینجا}} D_f = \mathbb{R} - \left\{-\frac{1}{2}\right\}$$

(2)

$$f(n) = \begin{cases} \frac{n^2 + 2n^2 - n - 2}{n^2 - 1} & ; n \neq \pm 1 \\ \frac{an+b}{n+1} & ; n = \pm 1 \end{cases}$$

(3)

$$Dg, Df = \mathbb{R} \xrightarrow{g=f} g=f \rightarrow \underline{c=2} \quad \left| \begin{array}{l} g(1)=f(1) \rightarrow \frac{a+2}{b+1} = 3 \rightarrow a+2=3b+3 \\ g(-1)=f(-1) \rightarrow \frac{-a+2}{b-1} = 1 \rightarrow b-1=-a+2 \\ \rightarrow a = -b+3 \end{array} \right.$$

$$b+c = \frac{2}{1/2}$$

$$\begin{array}{l} -b+3+2=3b+3 \\ \rightarrow b = -1/2 \\ \underline{a = 3/2} \\ \underline{c = 2} \end{array}$$

$$f(n) = \frac{n+1}{n-c} \rightarrow D_f = D_g \Rightarrow n^2 + an + b = (n-c)^2 \rightarrow \underline{a = -2c}$$

$$g(n) = \frac{n^2-1}{n^2+an+b} \xrightarrow{f=g} \frac{(n-c)(n-1)}{n^2-(c+1)n+c} \rightarrow \underline{a = -c-1} \rightarrow \underline{c=1} \rightarrow \underline{b=1}$$

$$\begin{array}{l} a+bc = -2c+c+c = 0 \\ a+b+c = -2+1+1 = 0 \end{array}$$

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

$$(n-2)^2(n) + \left[\frac{(n+1)^2}{(-n-1)^2} (-n) \right] = n \left[\frac{(n-2)^2 - (n+1)^2}{-n} \right] = \underline{\underline{-4n^2}}$$

(4)

$$f(1-\sqrt{n}) = \begin{cases} \sqrt{n+1} & n < 1 \\ \sqrt{n} & n > 1 \end{cases}$$

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$$f(-1) + f(1) = \sqrt{1+1} + 1 = \sqrt{2} + 1$$

$\downarrow$ $\sqrt{1-\sqrt{n}} = 1$ $\downarrow$ $n = 0$
 $\downarrow$ $n = 1$ $\downarrow$ $f(1) = 1$

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

✓

$$f(4) = ? \rightarrow n + \sqrt{n} = 4 \rightarrow n + \sqrt{n} - 4 = (\sqrt{n} + 1)(\sqrt{n} - 3) = 0$$

$\downarrow$ $\sqrt{n} = 3, \sqrt{n} = -1 \rightarrow n = 9$
 $\downarrow$ $n = 9$ $\downarrow$ $f(9) = 9 + 3 = 12$

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

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

$$\rightarrow (n-1) + \sqrt{n-1} + (1-n) + \sqrt{1-n} = 0$$

$$\rightarrow f(a) + f(-a) = a + \sqrt{a} - a - \sqrt{a} = 0$$

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

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$$g(n) = \sqrt{n-1} + 1 - n \rightarrow g(1) = 1 - 1 = 0$$

$$f \cdot g = \{(1, 1)\}$$

$$\sqrt{a} = \frac{b}{c} = k \rightarrow a = \frac{b^2}{c^2} = k^2$$

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$$f \cdot g = \{(1, 1)\}$$

$$\rightarrow [\frac{a}{c^2}, \infty) \cap (-\infty, \frac{b}{c^2}] \rightarrow \frac{a}{c^2} = \frac{b}{c^2} = 1 \rightarrow a = \frac{b^2}{c^2}$$

$$\rightarrow f(1) = g(1) = 1$$

$$\rightarrow \frac{1}{k} - 1 = 1 - k \rightarrow k = 1$$

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

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$$g(n) = \sqrt{n+1}$$

$$D_{f \cdot g} = [-1, v] \rightarrow D_f \cap D_g = [-1, v] \rightarrow m = v$$

$$f \cdot g(x) = 4\sqrt{x}$$

$$f(1) = g(1) = 2\sqrt{1} = 2$$

$$f(4) = g(4) = 4\sqrt{4} = 8$$

$$\rightarrow n = 4\sqrt{x} - 1$$

$$\rightarrow m + n = 4\sqrt{x} + 1$$