

$$f(-2) = 3a - 4$$

$$2f(0) = f(-2) + a \Rightarrow f(0) = 3a - 4$$

$$f(0) = 7a + 4$$

$$\Rightarrow 3a - 4 = 7a + 4$$

$$4a = -8$$

$$a = -2$$

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$$f(2-\sqrt{3}) = \sqrt{2-\sqrt{3}} + \frac{1}{\sqrt{2-\sqrt{3}}} + 2 \quad f(2+\sqrt{3}) = \sqrt{2+\sqrt{3}} + \frac{1}{\sqrt{2+\sqrt{3}}} + 2$$

$$f(2-\sqrt{3}) = \sqrt{2-\sqrt{3}} + \frac{1}{\sqrt{2-\sqrt{3}}} + 2 \quad f(2+\sqrt{3}) = \sqrt{2+\sqrt{3}} + \frac{1}{\sqrt{2+\sqrt{3}}} + 2$$

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$$f(2-\sqrt{3}) + f(2+\sqrt{3}) = 2(\sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}} + 2)$$

$$\rightarrow 2-\sqrt{3} = a \quad 2+\sqrt{3} = b \quad f(a) + f(b) = \sqrt{a} + \sqrt{b} + \frac{1}{\sqrt{a}} + \frac{1}{\sqrt{b}} + 4 = 2(\frac{\sqrt{a} + \sqrt{b}}{\sqrt{4}}) + 4 = 2\sqrt{4} + 4 = 12$$

$$2f(n) - 3f(-n) = 3n^2 - 9 \quad 2f(n) - 4f(-n) = 11n^2 - 5n$$

$$\xrightarrow{n=-n} -3f(n) + 2f(-n) = 3n^2 + 9 \quad -2f(n) + 4f(-n) = 11n^2 + 5n$$

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$$\Rightarrow -2f(n) = 3n^2 + 9 \Rightarrow f(n) = -\frac{3n^2 + 9}{2}$$

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

$$\xrightarrow{n=0} 2f(0) - 3f(2) = f(2) - 1 \Rightarrow f(0) = \frac{3f(2) - 1}{2}$$

$$\xrightarrow{n=-2} 4f(0) = 1 \Rightarrow f(0) = \frac{1}{4}$$

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$$\Rightarrow \frac{3n-1}{2} = \frac{1}{4} \Rightarrow 1 \cdot n + 3 \cdot 0 = 1 \cdot n \Rightarrow 1 \cdot n = 3 \Rightarrow n = \frac{3}{2}$$

$$f(0) = \frac{3 \times \frac{3}{2} - 1}{2} = \frac{\frac{9}{2} - 1}{2} = \frac{\frac{7}{2}}{2} = \frac{7}{4}$$

$$f(n) = an + b \Rightarrow f(\frac{1}{n}) = \frac{a}{n} + b \Rightarrow f(n) + f(\frac{1}{n}) = \frac{a}{n} + an + b$$

$$= \frac{3n^2 - 11n + 3}{n} = 3n + \frac{3}{n} - 11 \Rightarrow a = 3, b = -4$$

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$$f(-1) = 3(-1) - 4 = -3 - 4 = -7$$

$$f(u) = (u-1)\sqrt{1-u} \rightarrow D_f = (-\infty, 1] \rightarrow D_f = D_g$$

$$g(u) = -\sqrt{(1-u)^3} \rightarrow D_g = (-\infty, 1]$$

$$g(u) = \sqrt{(1-u)^3} = \pm \sqrt{(1-u)^2(1-u)} = -|1-u|\sqrt{1-u} \xrightarrow{u \leq 1} g(u) = (u-1)\sqrt{1-u}$$

$$\Rightarrow g(u) = f(u) \text{ برابری هستند.}$$

$$f(u) = u\sqrt{u} \rightarrow D_f = [0, +\infty) \Rightarrow D_f = D_g$$

$$g(u) = \sqrt{u^3} \rightarrow D_g = [0, +\infty)$$

$$g(u) = \sqrt{u^3} = |u|\sqrt{u} \xrightarrow{u \geq 0} g(u) = u\sqrt{u}$$

$$\Rightarrow g(u) = f(u) \text{ برابری هستند.}$$

$$f(u) = [\sqrt{u} - \lfloor \sqrt{u} \rfloor] \rightarrow 0 \leq \sqrt{u} - \lfloor \sqrt{u} \rfloor < 1 \text{ همواره برابری صحت}$$

$$g(u) = \sqrt{u - \lfloor u \rfloor} \rightarrow D_g = [0, 1] \text{ و } D_f = [0, 1]$$

$$u - \lfloor u \rfloor \geq 0 \xrightarrow{\text{به شرط } u \geq 0} \text{ همواره صحت}$$

$$\Rightarrow \text{برابری هستند.}$$

$$f(x) = \{(1, 2), (2, 3), (3, 1), (0, 0)\} \quad g = \{(1, 1), (1, 1), (2, 3), (3, 0), (0, 2), (1, 2)\}$$

$$\text{الف) } \left(\frac{f(x)}{f(y)}\right)(1) = \frac{2}{2-1} = 2$$

$$\text{ب) } \left(\frac{f(x)}{f(y)}\right)(2) = \frac{3}{0} \rightarrow \text{تعیین نشده}$$

$$\text{ج) } f(0)g(-1) = 0 \times 1 = 0$$

$$f(u) = \{(2, 1), (-1, 4), (0, \infty), (-2, 2), (3, -1)\}$$

$$\text{الف) } g(u) = \{(1, 1), (0, 4), (\frac{1}{3}, \infty), (-\frac{1}{3}, 2), (\frac{4}{3}, -1)\}$$

$$\text{ب) } h(u) = f(g(u)) = \{(2, 1), (-2, 1), (0, \infty), (3, -1), (-3, -1)\}$$

-1, -2
تغییر