

۲. آخرین ضمیمه نوشتن

$$1) f(x) = \begin{cases} (a+1)(x+1) & ; x > 1 \\ 3a+2x & ; x \leq 1 \end{cases}$$

$$2) f(0) = f(-1) + a$$

$$f(0) = (a+1) \cdot 0 = 0a + 0$$

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

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

$$10a = -18$$

$$a = -1/8$$

۲۱

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

$$f(x - \sqrt{x}) + f(x + \sqrt{x})$$

$$(x - \sqrt{x})(x + \sqrt{x}) = 1 \rightarrow x - \sqrt{x} = \frac{1}{x + \sqrt{x}}$$

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

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

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

$$(\sqrt{x - \sqrt{x}} + \sqrt{x + \sqrt{x}})^2 = A$$

$$A^2 = 4 + 2\sqrt{1} = 4$$

$$A = \sqrt{4}$$

$$\rightarrow f(x - \sqrt{x}) + f(x + \sqrt{x}) = x + \sqrt{x} + \sqrt{x} + 4 = 2x + 4$$

21

$$\gamma f(n) - \epsilon f(-n) = \xi n^r - n$$

$$-n \rightarrow \gamma f(-n) - \epsilon f(n) = \xi n^r + n \xrightarrow{\times \frac{\gamma}{\epsilon}} \gamma f(-n) - \xi \gamma f(n) = \gamma n^r + 1/\omega n$$

$$\text{sub } -\gamma f(n) = \xi n^r + 1/\omega n$$

$$f(n) = -\xi n^r + 1/\gamma n$$

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31

$$(n+r)f(n) - \epsilon n f(n+r) = \xi n^r - m n + \epsilon m - 1/n$$

$$f(0) = ?$$

$$n = a \rightarrow \gamma f(a) = \epsilon m - 1 \xrightarrow{\times \epsilon} a m - \epsilon = \gamma f(a)$$

$$n = -r \rightarrow \gamma f(a) = 1\gamma + \omega m - 1 = a m + 1/\omega$$

$$a m - r = a m + 1/\omega$$

$$\xi n = 1/\omega$$

$$n = \xi / \omega$$

$$f(a) = \frac{\epsilon m - 1}{\epsilon} = \frac{\gamma f(a)}{\gamma} = \gamma / \epsilon \omega$$

41

$$f(n) = a n + b$$

$$f\left(\frac{1}{n}\right) = \frac{a}{n} + b$$

$$f(n) + f\left(\frac{1}{n}\right) = a n + b + \frac{a}{n} + b = a n + \frac{a}{n} + 2b$$

$$= \frac{a n^r + \epsilon b n + a}{n} = \frac{\epsilon n^r - 1/\epsilon n + \epsilon}{n}$$

$$\begin{aligned} a &= \epsilon \\ b &= -\epsilon \end{aligned} \quad \begin{cases} f(n) = \epsilon n - \epsilon \\ f(-1) = -a \end{cases}$$

4)

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

$$g(x) = -\sqrt{(1-x)^3} = -\sqrt{(1-x)^2(1-x)} = -(1-x)\sqrt{1-x} \rightarrow D_g = (-\infty, 1]$$

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

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

$$|1-x| \xrightarrow[\text{کسر از 1}]{\text{به ازای}} = 1-x \rightarrow g(x) = (x-1)\sqrt{1-x}$$

دو تابع برابر ✓

5)

$$f(x) = x\sqrt{x} \rightarrow D_f = x \geq 0$$

$$g(x) = \sqrt{x^3} = |x|\sqrt{x} \rightarrow g(x) = x\sqrt{x}$$

در دامنه تابع هر دو مثبت $\Rightarrow g(x) = x\sqrt{x}$

9

دو تابع برابر ✓

6)

$$f(x) = [\sqrt{x} - [\sqrt{x}]] \rightarrow D_f = x \geq 0$$

$$g(x) = \sqrt{x - [x]} \rightarrow D_g = x \geq 0$$

دو تابع به ازای هر مقداری برابر ✓

اگر x عدد صحیح باشد جواب صفری شود $x=9 \rightarrow 3-3=0$

به ازای عدد اعشاری هم صفری شود $x=4.5 \rightarrow [2.236] = 2 \rightarrow 2.236 - 2 = 0.236$

$$9) \quad g = \{(-1, 1), (1, 1), (2, 2), (3, 3), (4, 4), (5, 2), (\sqrt{5}, 1)\}$$

$$f = \{(1, 2), (2, 2), (3, 1), (4, 4)\}$$

$$1) \quad \left(\frac{f+g}{f-g} \right)(1) = \frac{f(1)+g(1)}{f(1)-g(1)} = 3$$

$$2) \quad \left(\frac{f+g}{f-g} \right)(2) = \frac{f(2)+g(2)}{f(2)-g(2)} = \text{تعريف نشده}$$

$$3) \quad f(4)g(-1) = 4 \times 1 = 0$$

10)

$$f(n) = \{(2, 1), (-1, 2), (4, 3), (-2, 2), (5, -1)\}$$

$$1) \quad g(n) = f(3n-1)$$

$$\{(1, 1), (5, 2), (\frac{1}{3}, 3), (-\frac{1}{3}, 2), (\frac{4}{3}, -1)\}$$

$$3n-1=2 \quad n=1 \quad 3n-1=1 \quad n=0 \quad 3n-1=-2 \quad n=-\frac{1}{3}$$

$$2) \quad h(n) = f(n)$$

$$\{(2, 1), (4, 3), (3, -1), (-2, 2), (5, -1)\}$$