

$$f(-r) = 3a - 1^4$$

(1)

$$\Rightarrow 11a + 1^4 = 3a - 1^4 + a$$

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

$$10a = -11$$

$$a = -11/10$$

(2)

$$2 - \sqrt{3} = t$$

$$2 + \sqrt{3} = a$$

$$\Rightarrow a t = (2 - \sqrt{3})(2 + \sqrt{3}) = 1 \Rightarrow a = \frac{1}{t} \rightarrow \sqrt{a} = \frac{1}{\sqrt{t}}$$

(2)

$$\sqrt{a} + \frac{1}{\sqrt{a}} + \sqrt{t} + \frac{1}{\sqrt{t}} = \rightarrow 2\left(\sqrt{t} + \frac{1}{\sqrt{t}}\right)$$

$$\left(\sqrt{t} + \frac{1}{\sqrt{t}}\right)^2 = t + \frac{1}{t} + 2 = \rightarrow t + a + 2 = 5 \rightarrow \sqrt{t} + \frac{1}{\sqrt{t}} = \sqrt{5}$$

$$\text{جواب} = \sqrt{5} + 2 + \sqrt{5} + 2 = 2\sqrt{5} + 4$$

(3)

$$1 = x - \frac{1}{x} \left(2f(x) - 3f(-x) = 15x^2 - 2x \right)$$

$$\rightarrow \frac{15}{x} f(x) - \frac{9}{x} f(x) = \frac{1}{x} x^2 - \frac{2}{x} x + \frac{2}{x} x^2$$

$$-1 = -x \rightarrow 2f(x) - 3f(-x) = 15x^2 + x$$

$$\frac{d}{dx} f(x) = \frac{30}{x} x^2 + \frac{x}{x}$$

$$-2f(-x) = 10x^2 + x$$

$$f(x) = \frac{-15x^2 - \frac{x}{2}}{2}$$

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$$x=0 \rightarrow 2f(0) = 3m-1$$

(4)

$$x=-2 \rightarrow \frac{-5}{2} (5f(0) = 15 + 5m - 1 = 15 + 5m) \Rightarrow \frac{-11}{2} f(0) = -9 - 5m$$

$$\frac{-11}{2} f(0) = -10$$

$$\frac{11}{2} f(0) = 10$$

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$$f(x) + f\left(\frac{1}{x}\right) = \left(3x - 12\right) + \frac{3}{x} \quad (5)$$

$$\begin{cases} f\left(\frac{1}{x}\right) = a\left(\frac{1}{x}\right) + b \\ f(x) = ax + b \end{cases} \Rightarrow (+) \rightarrow \begin{cases} 2b = -12 \\ b = -6 \\ a = 3 \end{cases}$$

$$f(x) = 3x - 6 \Rightarrow f(-1) = -3 - 6 = -9$$

$$\begin{aligned} & \rightarrow x \leq 1 \\ & \rightarrow x \leq 1 \Rightarrow \text{دو تابع برابر} \end{aligned} \quad \begin{aligned} & \text{هر دو فصل هم} \\ & \rightarrow \text{نمایی کنند} \end{aligned} \quad \begin{cases} x = -1 \checkmark \\ x = 0 \checkmark \\ x = 1 \checkmark \end{cases} \quad (6)$$

$$\begin{aligned} & \rightarrow x \geq 0 \\ & \rightarrow x \geq 0 \Rightarrow \text{دو تابع برابر} \end{aligned} \quad \begin{aligned} & \text{هر دو فصل هم} \\ & \rightarrow \text{نمایی کنند} \end{aligned} \quad \begin{cases} x = 0 \checkmark \\ x = 1 \checkmark \\ x = 2 \checkmark \end{cases} \quad (7)$$

$$\begin{aligned} & \rightarrow x \geq 0 \\ & \rightarrow x \geq 0 \Rightarrow \text{دو تابع برابر} \end{aligned} \quad \begin{aligned} & \text{هر دو تابع} \\ & \rightarrow \text{تساوی هستند} \end{aligned} \quad \checkmark \quad (8)$$

$$\begin{aligned} & f_0 + g_0 \\ & \text{الف) } \frac{(2+1)}{2-1} = 3 \end{aligned} \quad \begin{aligned} & \text{ب) } \frac{3+3}{3-3} \rightarrow \text{تقسیم نشده} \end{aligned} \quad (9)$$

$$0 \times 1 = 0$$

الف) $g = \left\{ \left(-\frac{1}{4}, 2\right) (0, 2) \left(\frac{1}{4}, 2\right) (1, 1) \left(\frac{5}{4}, -1\right) \right\}$

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ب) $h = \left\{ (0, 5) (-2, 1) (2, 1) (-3, -1) (3, -1) \right\}$

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