

$$2f(a) = f(-2) + a \Rightarrow 2 \times 7 \times (a+1) = 4a - 4 \Rightarrow 14a + 14 = 4a - 4$$

$$10a = -18 \Rightarrow a = \frac{-9}{5}$$

(سوال ۱)

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

$$(2-\sqrt{3})(2+\sqrt{3}) = 1 \xrightarrow{\text{معادله را به هم ضرب می‌کنیم}} \text{مقادیر تابع برابرند}$$

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

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

$$\sqrt{4+3} + \sqrt{2-\sqrt{3}} + 2$$

(سوال ۲)

$$\Rightarrow 2(\sqrt{6}+2) = 4+2\sqrt{6}$$

$$\Rightarrow \frac{\sqrt{3}+1}{\sqrt{2}} + \frac{\sqrt{3}-1}{\sqrt{2}} = \frac{2\sqrt{3}}{\sqrt{2}} = \sqrt{6}+2$$

$$2f(x) - 2f(-x) = 4x^2 - x$$

$$(2f(-x) - 2f(x) = 4x^2 + x) \times \frac{5}{2}$$

$$\left. \begin{aligned} 2f(x) - 2f(-x) &= 4x^2 - x \\ -5\Delta f(x) + 2f(-x) &= 2x^2 + 5x \end{aligned} \right\} \Rightarrow \left. \begin{aligned} 2f(x) - 2f(-x) &= 4x^2 - x \\ -5\Delta f(x) + 2f(-x) &= 2x^2 + 5x \end{aligned} \right\} \text{جمع}$$

$$\Rightarrow -2,5\Delta f(x) = 10x^2 + \frac{1}{5}x$$

$$\Rightarrow f(x) = -4x^2 + \frac{1}{5}x$$

(سوال ۳)

$$x = -2 \rightarrow 4f(0) = 14 + 2m + 3m - 1$$

$$x = 0 \rightarrow (4f(0) = 3m - 1) \times 3$$

$$9m - 3 = 3m + 14 \Rightarrow m = 4,5$$

$$\Rightarrow 4f(0) = 3m - 1$$

$$\Rightarrow f(0) = \frac{3m-1}{4} = \frac{12,5}{4} \Rightarrow m = 6,25$$

(سوال ۴)

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

$$f(x) = ax + b, f\left(\frac{1}{x}\right) = \frac{a}{x} + b$$

$$\frac{a}{x} + ax + 2b = -3x + \frac{3}{x} - 12 \Rightarrow a = 3, b = -2$$

$$\Rightarrow f(x) = -3x - 2 \Rightarrow f(-1) = 3 - 2 = 1$$

(سوال ۵)

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

$$g(x) = -\sqrt{(1-x)^3}$$

$$D_f = (-\infty, 1]$$

$$D_g = (-\infty, 1]$$

عددگذاری

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

$$g(0) = -\sqrt{(1-0)^3} = -\sqrt{1} = -1$$

سوال ۶
همردن با هم برابر

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

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

$$D_f = \mathbb{R}^+$$

$$D_g = \mathbb{R}^+$$

بایکگذاری عدد

$$f(2) = 2\sqrt{2} = \sqrt{2} \times \sqrt{2}$$

$$g(2) = \sqrt{2^3} = \sqrt{2} \times \sqrt{2}$$

سوال ۷

$$f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor]$$

$$g(x) = \sqrt{x - \lfloor x \rfloor}$$

$$D_f = \mathbb{R}^+$$

$$D_g = \mathbb{R}^+$$

عددگذاری

$$f(2) = [\sqrt{2} - \lfloor \sqrt{2} \rfloor] = 0$$

$$g(2) = \sqrt{2 - \lfloor 2 \rfloor} = 0$$

سوال ۸

الف) $\left(\frac{f+g}{f-g}\right)(1) = \frac{1+2}{2-1} = 3$ ب) $\left(\frac{f+g}{f-g}\right)(2) = \frac{3+3}{3-3} = \text{تن}$

سوال ۹

ج) $f(0) \cdot g(-1) = 0 \times g(-1) = 0$

الف) $f(2x-1) = \left\{ (1, 1), (0, 4), \left(\frac{1}{4}, 0\right), \left(-\frac{1}{3}, 2\right), \left(\frac{4}{3}, -1\right) \right\}$

سوال ۱۰

ب) $f(1 \times 1) \Rightarrow \left\{ (2, 1), (-2, 1), (0, 0), (3, -1), (-3, -1) \right\}$