

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

$$f(a) = (a+1)(a+2) = 4a + 4 \Rightarrow 2(4a + 4) = 4a - 4 \Rightarrow 10a = -18 \Rightarrow a = -\frac{18}{10} = -\frac{9}{5}$$

$$\sqrt{x-\sqrt{x}} = t \Rightarrow \sqrt{x+\sqrt{x}} = \frac{1}{t}$$

$$f(x+\sqrt{x}) + f(x-\sqrt{x}) = x\left(t + \frac{1}{t}\right) + 4$$

$$\left(t + \frac{1}{t}\right)^2 = x - \sqrt{x} + x + \sqrt{x} + 2 = 4 \Rightarrow t + \frac{1}{t} = \sqrt{4} \Rightarrow \text{جواب آخر} \rightarrow \boxed{2\sqrt{4} + 4}$$

$$f(-x) \rightarrow 2f(-x) - 4f(x) = 4x^2 + x$$

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

$$4f(x) - 4f(-x) + 4f(-x) - 9f(x) = 8x^2 - 2x + 12x^2 + 4x$$

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

$$x=0 \rightarrow 2f(0) - 4(0)f(2) = 4m - 1 \Rightarrow 2f(0) = 4m - 1$$

$$x=-2 \rightarrow (0)f(-2) + 4f(0) = 4(-2)^2 - m(-2) + 4m - 1 \Rightarrow 4f(0) = 15 + 2m$$

$$\Rightarrow 4f(0) = 4(2m - 1) = 8m - 4 \Rightarrow 8m - 4 = 15 + 2m \Rightarrow 6m = 19 \Rightarrow m = \frac{19}{6}$$

$$f(0) = \frac{25}{2} - 1 = \frac{23}{2} \quad f(0) = \frac{20}{4}$$

$$\frac{4x^2 - 12x + 9}{x} = 2x - 12 + \frac{9}{x}$$

$$f(x) + f\left(\frac{1}{x}\right) = ax + b + \frac{a}{x} + b = ax + 2b + \frac{a}{x} = 2x - 12 + \frac{9}{x} \Rightarrow a=2, b=-6$$

$$f(x) = 2x - 6 \Rightarrow f(-1) = -2 - 6 = \boxed{-8}$$

(6) دامنی هر دو $x \leq 1$ است. با اين x - 1 بزرگتر مساوی صفر است پس $f=g$

$$\sqrt{x^3} = x\sqrt{x} = \sqrt{x^2 x} \Rightarrow g=f$$

(7) دامنی هر دو $x \geq 0$ است

$$g(x) \rightarrow x - |x| \geq 0 \Rightarrow x \geq 0 \xrightarrow{x \geq 0} x - x = 0 \Rightarrow g(x) \text{ همواره صفر و } x \geq 0 \text{ همواره صفر}$$

$$f(x) \rightarrow x \geq 0 \quad 0 \leq \sqrt{x} - [\sqrt{x}] < 1 \Rightarrow \text{همواره صفر است}$$

$$\Rightarrow g=f$$

$$\left(\frac{f+g}{f-g}\right)(1) = \left(1, \frac{1+2}{2-1}\right) = (1, 3) \rightarrow \boxed{3}$$

(٩) الف

$$\left(\frac{f+g}{f-g}\right)(2) = \left(2, \frac{2+3}{2-3}\right) = \left(2, \frac{5}{-1}\right) \rightarrow \boxed{\text{X } \infty}$$

بـ

$$f(0) = 0 \quad g(-1) = 1 \Rightarrow f(0)g(-1) = \boxed{0}$$

جـ

$$2x-1 = 2, -1, 0, -2, 3 \Rightarrow x = -\frac{1}{2}, 0, \frac{3}{2}, 1, \frac{5}{2}$$

(١٥) الف

$$g(x) = \left\{ \left(-\frac{1}{2}, 1\right), (0, 4), \left(\frac{3}{2}, 5\right), (1, 1), \left(\frac{5}{2}, -1\right) \right\}$$

$$x \text{ نامنتهي} \rightarrow 0, 2, 3 \Rightarrow h(x) = \left\{ (-2, -1), (-2, 1), (0, 5), (2, 1), (3, -1) \right\}$$

بـ