

۲. آزمون عالی نوشتن هر هفته همین برای یاد گرفتن

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

$$f(a) = (a+1)(a+2) = 7a+7 \Rightarrow 2(7a+7) = 4a-4 \Rightarrow 10a = -18 \Rightarrow a = -\frac{18}{10} = -\frac{9}{5}$$

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

$$f(2+\sqrt{2}) + f(2-\sqrt{2}) = 2\left(t + \frac{1}{t}\right) + 4$$

$$\left(t + \frac{1}{t}\right)^2 = 2 - \sqrt{2} + 2 + \sqrt{2} + 2 = 6 \Rightarrow t + \frac{1}{t} = \sqrt{6} \Rightarrow \text{جواب آخر} \rightarrow \boxed{4\sqrt{6} + 4}$$

$$f(-x) \rightarrow 2f(-x) - 4f(x) = 8x^2 + x$$

$$f(x) \rightarrow 2f(x) - 4f(-x) = 8x^2 - x$$

$$4f(x) - 6f(-x) + 6f(-x) - 9f(x) = 8x^2 - 2x + 12x^2 + 2x$$

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

$$x=0 \rightarrow 2f(0) - 4f(2) = 8m-1 \Rightarrow 2f(0) = 8m-1$$

$$x=-2 \rightarrow (0)f(-2) + 6f(0) = 8(-2)^2 - m(-2) + 8m-1 \Rightarrow 6f(0) = 15 + 4m$$

$$\Rightarrow 6f(0) = 4(8m-1) = 32m-4 \Rightarrow 32m-4 = 15+4m \Rightarrow 28m = 19 \Rightarrow m = \frac{19}{28}$$

$$f(0) = \frac{27}{28} - 1 = -\frac{1}{28} \quad f(2) = \frac{25}{28}$$

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

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

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

۶) دامنی هردو $x \leq 1$ است بنابراین $1-x$ بزرگتر مساوی صفر است پس $f=g$

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

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

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

$$\Rightarrow g=f$$

$$\left(\frac{f+g}{f-g}\right)(1) = \left(1, \frac{1+2}{2-1}\right) = (1, 2) \rightarrow \boxed{2} \quad (9) \text{ الف}$$

$$\left(\frac{f+g}{f-g}\right)(2) = \left(2, \frac{2+2}{2-2}\right) = (2, \frac{4}{0}) \rightarrow \boxed{\text{X} \text{ } \infty} \quad (10) \text{ ب}$$

$$f(0) = 0 \quad g(-1) = 1 \Rightarrow f(0)g(-1) = \boxed{0} \quad (11) \text{ ج}$$

$$2x-1 = 2, -1, 0, -2, 2 \Rightarrow x = -\frac{1}{2}, 0, \frac{2}{2}, 1, \frac{3}{2} \quad (12) \text{ د}$$

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

$$x \text{ ناممكن } \rightarrow 0, 2, 2 \Rightarrow h(x) = \{(-2, -1), (2, 1), (0, 4), (2, 1), (2, -1)\} \quad (13) \text{ ه}$$