

$$f(x) = \begin{cases} (a+1)(x+2) & x > 1 \\ 3a+2x & x \leq 1 \end{cases} \quad \begin{aligned} & 2f(x) = f(-x) + a \\ & 2(3a+2) = 3a-1+a \rightarrow 13a+4 = 4a-1 \rightarrow a = -18 \end{aligned} \quad (1)$$

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

$$f(2-\sqrt{3}) + f(2+\sqrt{3}) = \sqrt{2-\sqrt{3}} + \frac{1}{\sqrt{2-\sqrt{3}}} + 2 + \sqrt{2+\sqrt{3}} + \frac{1}{\sqrt{2+\sqrt{3}}} + 2$$

$$2\sqrt{2-\sqrt{3}} + 2\sqrt{2+\sqrt{3}} + f \xrightarrow{\text{بهرینه}} 2\sqrt{3} + 2-\sqrt{3} + 2 = 4 \rightarrow \text{پس } \sqrt{4} \rightarrow \sqrt{4+4}$$

$$2f(x) - 2f(-x) = 4x^2 - x \rightarrow 4f(x) - 4f(-x) = 8x^2 - 2x \quad (3)$$

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

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

$$(x+2)f(x) - 3xf(x+2) = 4x^2 - mx + 3m-1 \quad (4)$$

$$x=0 \Rightarrow 2f(0) = 3m-1 \quad \left\{ \begin{aligned} x=-2 \Rightarrow 4f(0) &= 14+2m+3m-1 = 13+5m \\ 9m-3 &= 13+5m \end{aligned} \right.$$

$$9m-3 = 13+5m \rightarrow 4m = 16 \rightarrow m = 4 \quad f(0) = \frac{13+5 \cdot 4}{4} = \frac{33}{4}$$

$$f(x) + f\left(\frac{1}{x}\right) = \frac{3x^2 - 12x + 3}{x} \quad x=-1 \rightarrow 2f(-1) = \frac{3+12+3}{-1} = -18 \rightarrow f(-1) = -9 \quad (5)$$

$$f(x) = (x-1)\sqrt{1-x} \quad 1-x \geq 0 \rightarrow x \leq 1 \rightarrow Df = (-\infty, 1] \quad (6)$$

$$g(x) = -\sqrt{(1-x)^3} \quad (1-x)^3 \geq 0 \rightarrow Dg = (-\infty, 1] \quad \text{محدوده‌ای هم در بسته } \sqrt{\text{در اینجاست}}$$

$$f(x) = x\sqrt{x} \quad x \geq 0 \rightarrow Df = [0, +\infty) \quad (7)$$

$$g(x) = \sqrt{x^3} \quad x^3 \geq 0 \rightarrow Dg = [0, +\infty) \quad \text{محدوده‌ای هم در بسته } \sqrt{\text{در اینجاست}}$$

$$f(x) = [\sqrt{x} - [\sqrt{x}]] \quad x \geq 0 \rightarrow Df = [0, +\infty) \quad \textcircled{A}$$

$$g(x) = \sqrt{x - |x|} \quad x \geq |x| \rightarrow Dg = [0, +\infty) \quad \boxed{\text{در دلتا ری هم درسته \checkmark به برابری}}$$

$$\text{الف) } \left(\frac{f+g}{f-g}\right)(1) = \frac{2+1}{2-1} = \boxed{3} \quad \textcircled{A}$$

$$\text{ب) } \left(\frac{f+g}{f-g}\right)(2) = \frac{3+3}{3-3} = \boxed{\text{تعریف نشده}}$$

$$\text{ج) } f(0)g(-1) = 0 \times 1 = \boxed{0}$$

$$f(x) = \{(2, 1)(-1, 4)(0, 5)(-2, 2)(3, -1)\} \quad \textcircled{10}$$

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

$$\text{ب) } h(x) = f(|x|) \rightarrow h(x) = \{(2, 1)(0, 5)(3, -1)\}$$