

$$\underbrace{2(a+1)(5+2)}_{14} = 3a - 4 + a \rightarrow 14a + 14 = 4a - 4 \rightarrow 10a = -18$$

$$a = -1.8$$

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

$$f(2-\sqrt{3}) = \sqrt{2-\sqrt{3} + \frac{1}{2-\sqrt{3}} + 2} + 2 = \sqrt{9} + 2$$

$$f(2+\sqrt{3}) = \sqrt{2+\sqrt{3} + \frac{1}{2+\sqrt{3}} + 2} = \sqrt{9} + 2$$

$$f(2-\sqrt{3}) + f(2+\sqrt{3}) = 2\sqrt{9} + 4$$

$$\left. \begin{aligned} 2f(x) - 3f(-x) &= 4x^2 - x \rightarrow 2f(x) - 4f(-x) = 12x^2 - 2x \\ 2f(-x) - 3f(x) &= -4x^2 + x \rightarrow 4f(-x) - 9f(x) = -12x^2 + 3x \end{aligned} \right\} \Rightarrow \begin{aligned} -5f(x) &= -4x^2 + x \\ f(x) &= \frac{4x^2 - x}{5} \end{aligned}$$

$$\text{if } x=0 \rightarrow 2f(0) - 3(0)f(1) = 3m - 1 \rightarrow 2f(0) = 3m - 1$$

$$\text{if } x=-2 \rightarrow (0)f(-2) + 4f(0) = 14 + 2m + 3m - 1 \Rightarrow 4f(0) = 5m + 15$$

$$\Rightarrow 5m + 15 = 9m - 2 \rightarrow 4m = 17 \rightarrow m = 4.25$$

$$f(-1) + f\left(\frac{1}{-1}\right) = 2f(-1) = \frac{3+12+3}{-1} = -18 \Rightarrow f(-1) = -9$$

$$f(x) = (x-1)\sqrt{1-x} \rightarrow Df = (-\infty, 1]$$

$$g(x) = -\sqrt{(1-x)^3} \rightarrow Dg = (-\infty, 1] \rightarrow -\sqrt{(1-x)^2(1-x)} = -|1-x|\sqrt{1-x} = (x-1)\sqrt{1-x}$$

چون $(1-x) = |1-x|$ $x \leq 1$

دو تابع برابرند

$$f(x) = x\sqrt{x} \quad \left. \begin{aligned} Df &= [0, +\infty) \\ Dg &= [0, +\infty) \end{aligned} \right\} \rightarrow g(x) = x\sqrt{x}$$

$$g(x) = \sqrt{x^3} \rightarrow \sqrt{x^2 x} = |x|\sqrt{x}$$

چون $x \geq 0$ است پس $|x| = x$

دو تابع برابرند

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

(۸)

$$g(x) = \sqrt{x - |x|} \rightarrow x - |x| \geq 0 \Rightarrow x \geq |x| \rightarrow D(g) = [0, +\infty) \Rightarrow |x| = x \Rightarrow g(x) = 0$$

$$[\sqrt{x} - [\sqrt{x}]] \xrightarrow[\text{کامل}]{\text{بجای } x} \sqrt{x} - [\sqrt{x}] = 0 \quad \text{اگر } x \text{ مربع کامل نباشد، } \sqrt{x} = a/b \text{ در نتیجه}$$

$$g(x) = 0 \quad \text{در نتیجه} \quad [0, b] = 0 \quad \text{و} \quad \sqrt{x} - [\sqrt{x}] = 0, b \quad \text{و} \quad [\sqrt{x}] = a$$

دو تابع برابرند.

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

(۹)

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

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

$$\text{الف) } 3x-1 = \left\{ \begin{array}{l} 2 \Rightarrow x=1 \\ -1 \Rightarrow x=0 \\ 0 \Rightarrow x=\frac{1}{3} \\ -2 \Rightarrow x=-\frac{1}{3} \\ 3 \Rightarrow x=\frac{4}{3} \end{array} \right\} \quad g(x) = \left\{ (1, 1), (0, 2), \left(\frac{1}{3}, 5\right), \left(-\frac{1}{3}, 2\right), \left(\frac{4}{3}, -1\right) \right\}$$

(۱۰)

$$\text{ب) } |x| = \left\{ \begin{array}{l} 2 \Rightarrow x = \pm 2 \\ -1 \Rightarrow \text{تن} \\ 0 \Rightarrow x=0 \\ -2 \Rightarrow \text{تن} \\ 3 \Rightarrow x = \pm 3 \end{array} \right\} \Rightarrow h(x) = \left\{ (2, 1), (-2, 1), (0, 5), (3, -1), (-3, -1) \right\}$$