

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

$$f(-1) = \sqrt{2}a - \sqrt{2}$$

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

$$1\sqrt{2}a + 1\sqrt{2} = \sqrt{2}a - \sqrt{2} + a$$

$$\sqrt{2}a = -1\sqrt{2} \Rightarrow a = -1$$

$$a = -1$$

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

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

$$-2f(x) = 20x^2 + 20$$

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

سوال 3:

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

$$\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 = x + \frac{1}{x} + 2 = 2 + \sqrt{3} + \frac{1}{2+\sqrt{3}} + 2 = 9$$

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

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

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

$$x=0 \Rightarrow (2f(0) = 3m-1) \times 3 \Rightarrow 4f(0) = 9m-3$$

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

$$10 + 2m = 9m-3 \quad 3m \geq 1 \quad m = 1, 2$$

$$f(0) = \frac{3 \times 1 - 1}{2} = \frac{1 \times 2 - 1}{2} = \frac{1 \times 2}{2} = 1$$

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$$f(-1) + f(-1) = \frac{3 + 1 \times 2 + 3}{-1} \Rightarrow 2f(-1) = -18 \quad f(-1) = -9$$

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$$D_f = x \leq 1 \Rightarrow D_f = D_g$$

$$D_g = x \leq 1$$

$$R_f = R_g \Rightarrow f(x) = g(x) \quad \text{در تابع برابرند}$$

ضابطه ها یکسان عمل می کنند

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$$\left. \begin{array}{l} D_f = x \geq 0 \\ D_g = x \geq 0 \end{array} \right\} D_f = D_g \Rightarrow f(x) = g(x)$$

$$R_f = R_g \quad \text{دو تابع برابرند}$$

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$$D_f = x \geq 0 \quad f(x) = \underbrace{[\sqrt{x} - [\sqrt{x}]]}_{\text{بین دو}} = 0$$

$$D_g = x \geq 0 \quad g(x) = \sqrt{\frac{x - |x|}{0}} = 0$$

هر دو تابع به ازای تمام مقادیر دامنه $x \geq 0$ برابر صفر است.

در تابع برابرند

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الف) $\begin{matrix} g(1) = 1 \\ f(1) = 2 \end{matrix} \Rightarrow \frac{1+1}{1-1} = 3$

ب) $\begin{matrix} g(2) = 3 \\ f(2) = 3 \end{matrix} \Rightarrow \frac{3+3}{2-3} = \frac{6}{-1} = -6 \rightarrow \text{تکلف نشده}$

ج) $\begin{matrix} f(0) = 0 \\ g(0) = 1 \end{matrix} \Rightarrow 0 \times -1 = 0$

الف) $3t-1=x \Rightarrow t = \frac{x+1}{3} = 1 \Rightarrow g(1) = 1 \quad t = \frac{0+1}{3} = \frac{1}{3} \rightarrow g(\frac{1}{3}) = 5$

$t = \frac{x+1}{3} = 0 \Rightarrow g(0) = 4 \quad t = \frac{-1+1}{3} = 0 \Rightarrow g(0) = 4$

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

ب) ① $|a| = 2 \rightarrow x = \pm 2$

② $|a| = 0 \rightarrow x = 0$

③ $|a| = 3 \rightarrow x = \pm 3$

$|x| = 1 \quad x$ $|x| = -2 \quad x$

$h(x) = \{(2, 1), (-2, 1), (3, -1), (-3, -1), (0, 5)\}$