

$$r(a+1)(v) = 2a - 9 + a$$

$$r(a+1) = (a+1)$$

$$\frac{r}{r} a + \frac{r}{r} = a + 1$$

$$\frac{9}{r} a + \frac{9}{r} = a + 1 \Rightarrow a = -\frac{1}{9}$$

1

$$f(r-\sqrt{r}) + f(r+\sqrt{r})$$

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

$$(\sqrt{r-\sqrt{r}} + \sqrt{r+\sqrt{r}})^2 = r - \sqrt{r} + r + \sqrt{r} + 2 = 4 \Rightarrow \sqrt{4}$$

2

$$x \begin{cases} 4f(x) - 3f(-x) = f(x^2 - 2) \\ 4f(-x) - 3f(x) = f(x^2 + x) \end{cases}$$

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$$\begin{cases} 4f(x) - 3f(-x) = 11x^2 - 2 \\ 4f(-x) - 3f(x) = 11x^2 + 3x \end{cases}$$

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$$-2f(x) = 11x^2 + 3x \Rightarrow f(x) = -\frac{11}{2}x^2 - \frac{3}{2}x$$

3

$$x = -2 \rightarrow 4f(-2) = 14 + 2m - 1 \rightarrow f(-2) = \frac{13}{4} + \frac{m}{2}$$

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

$$\textcircled{1} \downarrow \frac{13}{4} + \frac{m}{2} = 2m - 1$$

$$13 + 2m = 8m - 4$$

$$17 = 6m$$

$$\frac{17}{6} = m$$

$$f(x) = \frac{1}{4} \left(x + \frac{9}{x} \right) = \frac{1}{4} \times \frac{10}{x} = \frac{10}{4x}$$

4

$$f(x) + f\left(\frac{1}{x}\right) = \frac{11x^2 - 12x + 3}{x}$$

$$ax + b + \frac{a}{x} + b = \frac{ax^2 + bx + a}{x} = \frac{11x^2 - 12x + 3}{x} \quad \begin{matrix} b = -4 \\ a = 3 \end{matrix}$$

$$11x - 4 \xrightarrow{\textcircled{1}} -9$$

$$f(-1)$$

5

$$D_f \rightarrow 1-x, 0 \rightarrow 1, x$$

$$D_g \rightarrow (1-x), 0 \rightarrow 1, x$$

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

$$g(x) = -\sqrt{(1-x)^3} \rightarrow \frac{x-1}{-|1-x|} \sqrt{1-x}$$

$$\begin{cases} f(x) = x\sqrt{x} & D_f = [0, +\infty) \\ g(x) = \sqrt{x^3} \rightarrow D_g = [-\infty, +\infty) \end{cases}$$

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

$$g(x) = \sqrt{x-|x|}, g(x) = 0 \quad \text{برای } x \geq 0$$

$$\left(\frac{f+g}{f-g}\right)(1) = \frac{1+1}{1-1} = \infty \quad \left(\frac{f+g}{f-g}\right)(-1) = \frac{1+1}{1-1} = \infty \quad f(1)g(-1) = 0 \times 1 = 0$$

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

$$b) h(n) = f(|n|) = \left\{ (1, 1), (-1, 1), (0, 1), (1, 1), (-1, 1) \right\} = \left\{ (1, 1), (-1, 1), (0, 1), (1, 1), (-1, 1) \right\}$$