

$$f(a) = (a+1)(a+2) = 7a+7$$

$$f(-2) = 3a-2$$

$$2f(a) = f(-2) + a \rightarrow 15a+12 = 3a-2+a \rightarrow 10a = -14 \Rightarrow a = -1.4$$

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$$\frac{1}{\sqrt{x}-\sqrt{y}} \cdot \frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}+\sqrt{y}} \rightarrow \frac{1}{\sqrt{x}-\sqrt{y}} = \frac{\sqrt{x}+\sqrt{y}}{x-y} \rightarrow \frac{1}{\sqrt{x_1}-\sqrt{x_2}} = \frac{\sqrt{x_1}+\sqrt{x_2}}{x_1-x_2} = \frac{1}{\sqrt{x_1}-\sqrt{x_2}} + \frac{\sqrt{x_1}+\sqrt{x_2}}{x_1-x_2}$$

$$= \frac{1}{\sqrt{x_1}-\sqrt{x_2}} + \frac{\sqrt{x_1}+\sqrt{x_2}}{x_1-x_2}$$

$$\sqrt{x_1}-\sqrt{x_2} \Rightarrow (\sqrt{x_1}-\sqrt{x_2})^2 = x_1-x_2 \Rightarrow \sqrt{x_1}-\sqrt{x_2} = \frac{x_1-x_2}{\sqrt{x_1}+\sqrt{x_2}} \Rightarrow \frac{1}{\sqrt{x_1}-\sqrt{x_2}} = \frac{\sqrt{x_1}+\sqrt{x_2}}{x_1-x_2}$$

$$\Rightarrow \frac{1}{\sqrt{x_1}-\sqrt{x_2}} = \frac{\sqrt{x_1}+\sqrt{x_2}}{x_1-x_2}$$

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$$2f(n) - 3f(-n) = 2n^2 - n \xrightarrow{x^2} 2f(n) - 9f(-n) = 18n^2 - 2n$$

$$2f(-n) - 2f(n) = 2n^2 + n \xrightarrow{x^3} 4f(-n) - 9f(n) = 12n^2 + 3n$$

$$-5f(n) = 10n^2 + n$$

$$\rightarrow f(n) = -2n^2 - \frac{n}{5}$$

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$$2f(0) = 3m-1 \xrightarrow{x=a} -10f(0) = -15m+a$$

$$4f(0) = 14+am-1 \xrightarrow{x^3} 18f(0) = 21-2+15m$$

$$18f(0) = 50 \rightarrow f(0) = \frac{50}{18}$$

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$$ax+b + \frac{a}{n} + b = \frac{3n^2-12n+3}{n} = 3n-12 + \frac{3}{n} \rightarrow a=3, b=-9$$

$$f(-1) = -1 \times 3 - 9 = -12$$

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$\begin{cases} f(n) = (n-1)\sqrt{1-n} \rightarrow 1-n \geq 0 \rightarrow n \leq 1 \\ g(n) = -\sqrt{(1-n)^3} \rightarrow (1-n)^3 \geq 0 \rightarrow 1-n \geq 0 \rightarrow n \leq 1 \end{cases}$ $\Rightarrow Df = Dg \rightarrow \boxed{\text{در تابع مساویند}}$	۶
$\begin{cases} f(n) = n\sqrt{n} \rightarrow n \geq 0 \\ g(n) = \sqrt{n^3} \rightarrow n \geq 0 \end{cases}$ $\Rightarrow Dg = Df \rightarrow \boxed{\text{در تابع مساویند}}$	۷
$\begin{cases} f(n) = [\sqrt{n} - [\sqrt{n}]] \rightarrow n \geq 0 \\ g(n) = \sqrt{n - n } \rightarrow n \geq n \rightarrow n \geq 0 \end{cases}$ $\Rightarrow Dg = Df \rightarrow \boxed{\text{در تابع مساویند}}$	۸
$\text{الف) } \left(\frac{f+g}{f-g} \right)_{(1)} = \frac{1+2}{2-1} = \boxed{3}$ $\Rightarrow \left(\frac{f+g}{f-g} \right)_{(2)} = \frac{3+3}{0} = \frac{6}{0} \quad \boxed{\text{نن}}$ $\text{ب) } f(1)g(-1) = 0 \times 1 = 0$	۹
$\text{الف) } g(n) = f(3n-1) \rightarrow (1,1) (0,2) \left(\frac{1}{3}, 2\right) \left(-\frac{1}{3}, 2\right) \left(\frac{2}{3}, -1\right)$ $\Rightarrow h(n) = f(m) \rightarrow m = 2 \rightarrow n = \pm 2 \quad / \quad m = -1 \rightarrow \text{تعیین نمیشود} \quad / \quad m = 0 \rightarrow n = 0 \quad / \quad m = -2 \rightarrow \text{تعیین نمیشود}$ $ m = 3 \rightarrow n = \pm 3$ $\Rightarrow \boxed{(2,1) (-2,1) (0,2) (3,-1) (-3,-1)}$	۱۰