

$f(a) = (a+1)(a+2) = \sqrt{a+1} \quad , \quad f(-1) = 2a + 2(-2) = 2a - 4$ $\rightarrow 2f(a) = f(-1) + a \rightarrow 2\sqrt{a+1} = 2a - 4 + a \rightarrow 1\sqrt{a+1} = 3a - 4 \rightarrow$ $1 \cdot a = -1 \Rightarrow a = -1, 1$	۱
$A = \sqrt{x} + \frac{1}{\sqrt{x}} + 2 \rightarrow A - 2 = \sqrt{x} + \frac{1}{\sqrt{x}} \xrightarrow{\text{ضرب در } (A-2)^2} (A-2)^2 = x + \frac{1}{x} + 2 \xrightarrow{x = 2 - \sqrt{6}}$ $(A-2)^2 = 2 - \sqrt{6} + \frac{1}{2 - \sqrt{6}} + 2 = 2 - \sqrt{6} + \frac{2 + \sqrt{6}}{(2 - \sqrt{6})(2 + \sqrt{6})} + 2 = 2 - \sqrt{6} + \frac{2 + \sqrt{6}}{4 - 6} + 2 = 6 \rightarrow$ $(A-2)^2 = 6 \rightarrow A - 2 = \sqrt{6} \rightarrow A = 2 + \sqrt{6}$ $\Rightarrow f(2 + \sqrt{6}) = 2 + \sqrt{6} \quad f(2 - \sqrt{6}) = 2 - \sqrt{6}$ $f(2 + \sqrt{6}) + f(2 - \sqrt{6}) = 2(2 + \sqrt{6}) = 4 + 2\sqrt{6}$ $2 - \sqrt{6} = \frac{1}{2 + \sqrt{6}}$ از آنجایی که	۲
$\begin{cases} 2f(x) - 3f(-x) = 5x^2 - x \\ 2f(-x) - 3f(x) = 5x^2 + x \end{cases} \rightarrow \begin{aligned} &5f(x) - 6f(-x) = 10x^2 - 2x \\ &-9f(x) + 6f(-x) = 12x^2 + 2x \\ \hline &-4f(x) = 20x^2 + 2x \\ &f(x) = -5x^2 - \frac{x}{2} \end{aligned}$	۳
$\begin{aligned} x=0 &\rightarrow 2f(0) = 3m - 1 \rightarrow 2f(0) - 3m = -1 \quad \xrightarrow{-6f(0) + 9m = 3} \\ x=-5 &\rightarrow 9f(0) = 5m + 14 \quad \xrightarrow{6f(0) - 5m = 14} \end{aligned}$ $\begin{aligned} 2f(0) = 3m - 1 &\rightarrow f(0) = \frac{3m - 1}{2} \\ 9f(0) = 5m + 14 &\rightarrow 9 \cdot \frac{3m - 1}{2} = 5m + 14 \\ \frac{27m - 9}{2} = 5m + 14 &\rightarrow 27m - 9 = 10m + 28 \\ 17m = 37 &\rightarrow m = \frac{37}{17} \end{aligned}$	۴
$f(x) + f\left(\frac{1}{x}\right) = \frac{5x^2 - 12x + 5}{x} \rightarrow ax + b + \frac{a}{x} + b = 5x - 12 + \frac{5}{x}$ $\rightarrow ax + \frac{a}{x} + 2b = 5x + \frac{5}{x} - 12 \Rightarrow \begin{cases} a = 5 \\ b = -6 \end{cases}$ $f(x) = ax + b = 5x - 6 \xrightarrow{x=-1} f(-1) = -5 - 6 = -11$	۵

$\begin{cases} f(x) = -(1-x)\sqrt{1-x} \Rightarrow D_f = (-\infty, 1] \\ \quad = -\sqrt{(1-x)^3} \\ g(x) = -\sqrt{(1-x)^3} \Rightarrow D_g = (-\infty, 1] \end{cases}$ $D_f = D_g \rightarrow f = g$ متطابقان	٤
$\begin{cases} f(x) = x\sqrt{x} \rightarrow D_f = [0, +\infty) \\ \quad = \sqrt{x^2 \cdot x} = \sqrt{x^3} \\ g(x) = \sqrt{x^3} \rightarrow D_g = [0, +\infty) \end{cases}$ $\Rightarrow f = g$ متطابقان	٧
$\begin{cases} f(x) = [\sqrt{x} - \sqrt{x}] = 0, D_f = [0, +\infty) \\ g(x) = \sqrt{x - x } = 0, x - x \geq 0 \rightarrow x \leq x \rightarrow x \geq 0 \Rightarrow D_g = [0, +\infty) \end{cases}$ $f = g$ متطابقان	
الف) $\left(\frac{f+g}{f-g}\right)_{(1)} = \frac{f_{(1)}+g_{(1)}}{f_{(1)}-g_{(1)}} = \frac{2+1}{2-1} = 3$ ب) $\left(\frac{f+g}{f-g}\right)_{(2)} = \frac{f_{(2)}+g_{(2)}}{f_{(2)}-g_{(2)}} = \frac{2+3}{2-2} = \frac{5}{0} \rightarrow$ تعريف نشد ج) $f_{(0)} g_{(-1)} = (0) \cdot 1 = 0$	٩
الف) $g(x) = \{(1, 1), (0, 4), (\frac{1}{2}, 5), (-\frac{1}{2}, 2), (\frac{2}{3}, -1)\}$ ب) $h(x) = \{(2, 1), (-2, 1), (0, 4), (2, -1), (-2, -1)\}$	١٠