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$\begin{cases} f(x) = (x-1)\sqrt{1-x} \rightarrow 1-x \geq 0 \rightarrow x \leq 1 & D_f = (-\infty, 1] \\ g(x) = -\sqrt{(1-x)^3} \rightarrow (1-x)^3 \geq 0 \rightarrow 1-x \geq 0 \rightarrow x \leq 1 & D_g = (-\infty, 1] \end{cases} \Rightarrow D_f = D_g$ $g(x) = -\sqrt{(1-x)^3} = -\sqrt{(1-x)(1-x)^2} = \sqrt{(1-x)^2} \times \sqrt{1-x} \Rightarrow g(x) = -(1-x)\sqrt{1-x} = (x-1)\sqrt{1-x}$ $1-x = \frac{1-x}{1}$ $g(x) = f(x)$ "دو تابع مساوی اند"	۶
$\begin{cases} f(x) = x\sqrt{x} \rightarrow x \geq 0 & D_f = [0, +\infty) \\ g(x) = \sqrt{x^3} \rightarrow x^3 \geq 0 \rightarrow x \geq 0 & D_g = [0, +\infty) \end{cases} \Rightarrow D_f = D_g$ $g(x) = \sqrt{x^3} \rightarrow g(x) = \sqrt{x^2 \cdot x} = \sqrt{x^2} \times \sqrt{x} \Rightarrow g(x) = x\sqrt{x}$ $x = \frac{x^2}{x}$ $g(x) = f(x)$ "دو تابع مساوی اند"	۷
$\begin{cases} f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \rightarrow x \geq 0 & D_f = [0, +\infty) \\ g(x) = \sqrt{x - x } \rightarrow \begin{cases} x \geq 0 \rightarrow x = x \rightarrow x - x = 0 \geq 0 \checkmark \\ x < 0 \rightarrow x = -x \rightarrow x - (-x) = 2x < 0 \times \end{cases} & D_g = [0, +\infty) \end{cases} \Rightarrow D_f = D_g$ $[a - [a]] = 0 \rightarrow \sqrt{x} = a \rightarrow f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] = 0$ $g(x) = \sqrt{x - x } = \sqrt{0} = 0 \Rightarrow f(x) = g(x)$ "دو تابع مساوی اند"	۸
$f = \{(1,2)(2,3)(3,1)(0,0)\}, g = \{(-1,1)(1,1)(2,3)(3,0)(0,2)(\sqrt{2},1)\}$ الف) $\left(\frac{f+g}{f-g}\right)(1) = \frac{f_{(1)} + g_{(1)}}{f_{(1)} - g_{(1)}} = \frac{2+1}{2-1} = \frac{3}{1} = 3$ ب) $\left(\frac{f+g}{f-g}\right)(2) = \frac{f_{(2)} + g_{(2)}}{f_{(2)} - g_{(2)}} = \frac{3+3}{3-3} = \frac{6}{0} \rightarrow$ تعریف نشده ج) $f_{(0)} \cdot g_{(1)} = 0 \cdot 1 = 0$	۹
$f(x) = \{(1,1)(-1,1)(0,0)(-2,2)(3,-1)\}$ الف) $g(x) = f(x-1)$ $x-1=2 \rightarrow x=3 \rightarrow x=1 \Rightarrow g_{(1)} = f_{(2)} = 1$ $x-1=-1 \rightarrow x=0 \rightarrow x=0 \Rightarrow g_{(0)} = f_{(-1)} = 1$ $x-1=0 \rightarrow x=1 \rightarrow x=\frac{1}{1} \Rightarrow g_{(\frac{1}{1})} = f_{(0)} = 0$ $x-1=2 \rightarrow x=3 \rightarrow x=-\frac{1}{1} \Rightarrow g_{(-\frac{1}{1})} = f_{(2)} = 1$ $x-1=3 \rightarrow x=4 \rightarrow x=\frac{2}{1} \Rightarrow g_{(\frac{2}{1})} = f_{(3)} = -1$ ب) $h(x) = f\left(\frac{x}{ x }\right)$ $x =2 \rightarrow x=2 \text{ یا } x=-2 \Rightarrow h_{(2)} = f_{(2)} = 1, h_{(-2)} = f_{(-2)} = 1$ $x =0 \rightarrow x=0 \Rightarrow h_{(0)} = f_{(0)} = 0$ $x =3 \rightarrow x=3 \text{ یا } x=-3 \Rightarrow h_{(3)} = f_{(3)} = -1, h_{(-3)} = f_{(-3)} = -1$ $g(x) = \{(1,1)(0,1)(\frac{1}{1},0)(-\frac{1}{1},1)(\frac{2}{1},-1)\}$ $h(x) = \{(1,1)(-1,1)(0,0)(3,-1)(-3,-1)\}$	۱۰