

الف) $\sqrt{x|x|} \rightarrow x|x| \geq 0 \rightarrow x \geq 0$ بی $g(x) = x \rightarrow Dg = \mathbb{R} \rightarrow Df = [0, +\infty) \rightarrow Df = Dg \rightarrow$ در تابع ساری نیستند

ب) $\frac{(x+3)(x+1)+x+4}{x^2+5x+6} \Rightarrow \frac{x^2+4x+3+x+4}{x^2+5x+6} = \frac{x^2+5x+7}{x^2+5x+6} = 1 \rightarrow Df = \mathbb{R} = Dg \rightarrow$ در تابع ساری نیستند

ج) $\frac{4\sin^2 x - 4\sin x}{2\sin x - 3}, g(x) = 2\sin x \rightarrow \frac{2\sin x(2\sin x - 3)}{2\sin x - 3} = 2\sin x \rightarrow Df = Dg \rightarrow$ در تابع ساری نیستند

د) $f(x) = \frac{x}{|x|}, g(x) = \frac{|x|}{x}, |x| \neq 0 \rightarrow x \neq 0, x \neq 0 \rightarrow \mathbb{R} - \{0\} \rightarrow Df = Dg \rightarrow$ در تابع ساری نیستند

الف) $\lfloor 1 - \frac{1}{x^2} \rfloor = 0, g(x) = \lfloor x - \lfloor x \rfloor \rfloor = 0 \rightarrow Df = Dg = \mathbb{R} \rightarrow$ در تابع ساری نیستند

ب) $Df \Rightarrow \lfloor x - \lfloor x \rfloor \rfloor \neq 0 \rightarrow x \neq \lfloor 0, \frac{1}{2} \rfloor, \mathbb{R} - \{ \lfloor 0, \frac{1}{2} \rfloor \}, Dg = \lfloor x \rfloor \neq 0 \rightarrow \lfloor x \rfloor \neq 0 \rightarrow \mathbb{R} - \{0\}$

ج) $Df \Rightarrow x - |x| \geq 0 \rightarrow x \geq |x| \rightarrow \emptyset, Dg \Rightarrow |x| - x \geq 0 \rightarrow |x| \geq x \rightarrow \mathbb{R} \rightarrow$ در تابع ساری نیستند

د) $Df = \{x-1 \neq 0 \rightarrow x \neq 1, x=1 \rightarrow 2\} \rightarrow \mathbb{R}, Dg = \mathbb{R} \rightarrow$ در تابع ساری نیستند

$f(x) = \frac{x^2+x+1+x^2-x+1}{2} = \frac{2x^2+2}{2} = x^2+1 \rightarrow f(x)$

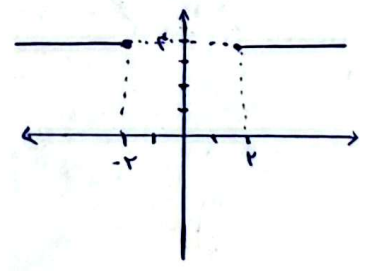
$g(x) = \frac{x^2+x+1-x^2-x-1}{2} = \frac{0}{2} = 0 \Rightarrow g(x) = 0$

$f^2(x) = (x^2+1)^2 = x^4+2x^2+1$

$g^2(x) = 0^2 = 0$

$g(x) \times f(x) \rightarrow (x+\sqrt{x^2-4})(x-\sqrt{x^2-4}) \xrightarrow{\text{عوض}} x^2 - x^2 + 4 = 4$

$x^2-4 \geq 0 \rightarrow x^2 \geq 4 \rightarrow \begin{cases} x \geq 2 \\ x \leq -2 \end{cases}$



$g(x) = \frac{x-b}{x^2-3x-10} \rightarrow Dg = \mathbb{R} - \left\{ \frac{a}{r}, -1 \right\} \rightarrow Df = \mathbb{R} - \left\{ \frac{a}{r}, -1 \right\} \rightarrow f(x) = \frac{ax+2}{(x-2)(x+1)}$

$x^2-3x-10 = (x-5)(x+2) \rightarrow \begin{cases} \frac{a}{r} \\ -\frac{2}{5} = -1 \end{cases}$

$g(x) = f(x) \rightarrow 2ax^3 - 3ax^2 - 5ax + 4x^2 - 4x - 10 = x^3 - 11x^2 - \frac{a}{5}x - bx^2 - 16bx + \frac{a}{5}b$

$\rightarrow b = -4, a = \frac{1}{5} \rightarrow am - bn = \frac{1}{5} \times 110 - (-4 \times 16) = \frac{110}{5} + 64 = \frac{130}{5} = 26$

$f(x) = C \rightarrow \frac{bx+y}{ax+b} = C \rightarrow bx+y = C(ax+b) \rightarrow ax+b=0 \rightarrow ax=-b \rightarrow a = \frac{-b}{x}$ $bx+y = C(ax+b) \rightarrow bx+y = Cax + Cb \rightarrow bx - Cax = Cb - y \rightarrow x(b-Ca) = Cb - y$ $x = \frac{Cb - y}{b - Ca}$ $b \neq Ca \rightarrow b \neq \pm \frac{b}{x} \rightarrow \frac{b}{x} \neq \pm \frac{b}{x} \rightarrow \frac{b}{x} \neq \pm \frac{b}{x}$ $\frac{ab}{c} \rightarrow \frac{-\frac{b}{x} \times b}{\frac{b}{x}} = -b \rightarrow \sigma_s: \pm 1$	۶
$xf = \{(-1, 2), (2, 1), (3, -2), (0, 1)\} \rightarrow f: \{(-1, 2), (2, 1), (3, -2), (0, \frac{1}{2})\}$ $yg = \{(2, 1), (3, 2), (-1, -1), (0, 0)\} \rightarrow f+g = \{(-1, -2), (2, 1), (3, 1)\}$ $\frac{yg}{f+g} = \{(2, 1), (3, 2), (-1, 1)\}$	۷
$d = a - 1$ $3a - 2b = 1 \rightarrow 3(-1) - 2b = 1 \rightarrow -2b = 4 \rightarrow b = -2$ $c = a - 3b \rightarrow c = -1 - 3(-2) = 5 \rightarrow c = 5$ $d + c = -1 + 5 = 4$	۸
$f(x) = g(x) \rightarrow \sqrt{-a^2 + b - m} = b$ $-(a^2 - a + m)$ $m = \frac{1}{4} \rightarrow \sqrt{-(a - \frac{1}{4})^2} \rightarrow - a - \frac{1}{4} = b$ $-a + \frac{1}{4} = b \leftarrow \text{در صورتی که جواب تدریجاً مثبت باشد}$ $a + b = \frac{1}{4}$	۹
$g(x) = f(x) \rightarrow D_g = D_f \rightarrow f(x) = g(x) \rightarrow x^2 + 4x + \frac{b}{a} = C$ $x^2 + 4x + \frac{b}{a} = C \rightarrow x^2 + 4x + \frac{b}{a} = C$ $\frac{2}{1 - (-3)} = \frac{2+a}{14} \rightarrow \frac{2+a}{14} = \frac{2+a}{14} \rightarrow \frac{2+a}{14} = \frac{2+a}{14}$ $32 = 1 + 4a \rightarrow 4a = 31 \rightarrow a = \frac{31}{4}$ $a + b + c = 12$	۱۰