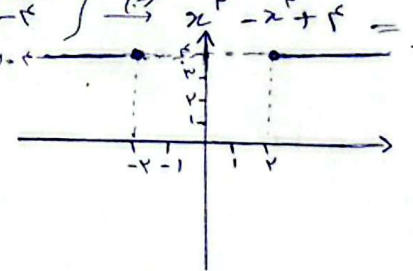


الف) $f(x) \rightarrow D_f = x | x \geq 0 \quad \left\{ \begin{array}{l} + \\ - \\ 0 \end{array} \right\} \quad [0, +\infty)$ $g(x) = D_g = \mathbb{R}$ برابر نیست
 ب) $f(x) \rightarrow \Delta$ برابر $\rightarrow \checkmark$ $D_f = \mathbb{R}$, $D_g = \mathbb{R}$ $\rightarrow$ برابر $\rightarrow \checkmark$
 ج) $D_f = \mathbb{R}$, $D_g = \mathbb{R}$ $\rightarrow$ برابر $\rightarrow \checkmark$ $\sin x = \frac{3}{4}$ $\rightarrow$ $2 \sin x (\sin x - \frac{3}{4})$ $\rightarrow$ $D_f = \mathbb{R}$ برابر $\rightarrow \checkmark$
 د) $D_f = \mathbb{R} - \{0\}$, $D_g = \mathbb{R} - \{0\}$ برابر $\rightarrow \checkmark$ $\rightarrow$ با اعداد + و -

الف) $f(x) \left[1 - \frac{1}{x^2+1} \right] = 0$, $g(x) = [x - [x]] = 0$ برابر است $\checkmark$
 $D_f = \mathbb{R}$ $D_g = \mathbb{R}$
 ب) $D_f = [2x] \neq 0 \rightarrow x \neq [0, \frac{1}{2}) = \mathbb{R} - \{[0, \frac{1}{2})\}$, $D_g = 2[x] \neq 0 \rightarrow [x] \neq 0 \rightarrow [0, 1)$ برابر نیست $\times$
 ج) $D_f \rightarrow x - |x| > 0 \rightarrow D_f = \emptyset$, $D_g \rightarrow |x| - x > 0 \rightarrow (0, +\infty)$ برابر نیست $\times$
 $-x + x > 0$ $\rightarrow x + x > 0$ $\rightarrow x > 0$ $\rightarrow (0, +\infty)$ برابر نیست $\times$
 د) $\frac{x^3-x}{x-1} = \frac{x(x^2-1)}{x-1} \rightarrow \frac{x(x-1)(x+1)}{x-1} \rightarrow \frac{x(x+1)}{1} = x^2+x$ برابر $\rightarrow \checkmark$

$f(x) + g(x) = x^2 + x + 1$ $f'(x) = (x^2+1)' = 2x + 2x + 1$
 $f(x) - g(x) = x^2 - x + 1$ $g'(x) = (x)^2 = x^2$
 $2f(x) = \frac{2x^2+2}{2(x^2+1)} \rightarrow f(x) = x^2+1$ $f'(x) - g'(x) = 2x^2 + x + 1$ برابر $\rightarrow \checkmark$
جوابی $g(x) = x$

$g(x) \times f(g(x)) = (x + \sqrt{x^2-4})(x - \sqrt{x^2-4}) \rightarrow x^2 - x^2 + 4 = 4$
 $x^2 - 4 \geq 0 \rightarrow x \leq -2$ or $x \geq 2$ $\rightarrow D_f = \{x | x \leq -2 \text{ or } x \geq 2\}$


$g(x) = \frac{x-b}{x^2-3x-a}$ $D_g = \mathbb{R} - \{\frac{a}{3}, -1\}$ $\rightarrow$ $D_f = \mathbb{R} - \{\frac{a}{3}, -1\}$ برابر $\rightarrow \checkmark$
 $f(x) = \frac{ax+2}{(x-\frac{a}{3})(x+1)}$
 $g(x) = f(x) \rightarrow \frac{x-b}{x^2-3x-a} = \frac{ax+2}{(x-\frac{a}{3})(x+1)}$
 $x^2-3x-a = x^2 - \frac{a}{3}x - \frac{a}{3}x - 1$ $\rightarrow$ $-3x - a = -\frac{2a}{3}x - 1$
 $-3x - a = -\frac{2a}{3}x - 1$ $\rightarrow$ $-\frac{7a}{3}x = a - 1$ $\rightarrow$ $x = \frac{1-a}{7a}$ برابر $\rightarrow \checkmark$

$am - bn = \frac{1}{x} \times \frac{1}{x} = \frac{1}{x^2} = \frac{1}{x^2} = \frac{1}{x^2}$ برابر $\rightarrow \checkmark$

$$f(x) = c \rightarrow \frac{bx+2}{ax+b} = c \rightarrow bx+2 = c(ax+b) \rightarrow ac = b, c = \frac{b}{a}$$

اگر $a+b=0 \rightarrow a = -b = a = \frac{-b}{1}$ $\hookrightarrow b \times \frac{b}{a} = 2$

$$\frac{ab}{c} \rightarrow \frac{-b}{\frac{b}{a}} \times b = -b \rightarrow \left(\frac{\pm 1}{\pm 1} \right) \rightarrow \pm 1$$

$$\frac{b^2}{a} = 2 \rightarrow b^2 = 2a$$

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$$pf = \{(-1, 4), (2, 1), (3, -4), (0, 1)\} \rightarrow f = \{(1, 2), (2, 4), (3, -2), (0, \frac{1}{2})\}$$

$$2g = \{(2, 1), (3, 3), (-1, -1), (0, 0)\}, f+g = \{(-1, -2), (2, 1), (3, 4)\}$$

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$$\frac{2g}{f+g} = \{(2, 1), (3, 3), (-1, -4)\}$$

$$\begin{aligned} a - 3b &= c \rightarrow -1 - 3(-2) = 5 = c \\ 3a - 2b &= 1 \rightarrow 3(-1) - 2b = 1 \rightarrow -2b = 4 \rightarrow b = -2 \\ a &= d = -1 \end{aligned}$$

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$$d + c = -1 + 5 = 4$$

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$$f(x) = g(x) \rightarrow \frac{\sqrt{-a^2 + a - m}}{-(a^2 - a + m)} = b$$

$$m = \frac{1}{a} \rightarrow \sqrt{-(a - \frac{1}{a})^2} \rightarrow -|a - \frac{1}{a}| = b$$

$$\begin{aligned} -a + \frac{1}{a} &= b \\ a + b &= \frac{1}{a} \end{aligned}$$

در صورتی که جواب در معادله مثبت شود

$$g(x) = f(x) \rightarrow P_g, P_f = c \rightarrow \text{مخرج } f(x) \text{ را مربع کامل می کنیم}$$

$$\frac{2}{1 - (-3)} = \frac{2+a}{14} \quad \text{با عدد 14 برای ابطال مخرج} \quad \frac{2}{1 - (-3)} = \frac{2+a}{14}$$

$$22 = 14 + 8a \rightarrow 8a = 8 \rightarrow a = 1 \quad a + b + c = 12$$

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