

الف) $f(x) = \sqrt{x(x+1)}$, $g(x) = x$ $x(x+1) \geq 0$ $x \geq 0$
 برابری نیست
 $D_f = [0, +\infty)$
 ب) $f(x) = (x+3)(x+1) + x + 4$, $g(x) = 1$
 $D_f = D_g \rightarrow (x+3)(x+1) + x + 4 = 1$
 $x^2 + 4x + 7 = 1$
 $x^2 + 4x + 6 = 0$
 $\Delta = 16 - 24 = -8$
 $D_f = \emptyset$
 ج) $f(x) = \sqrt{\sin x}$, $g(x) = \sin x$
 $D_f = D_g \rightarrow \sqrt{\sin x} = \sin x$
 $\sin x \geq 0$
 $\sin x = 0$
 $\sin x = 1$
 $\sin x = \frac{1}{4}$

د) $f(x) = \frac{x}{x^2+1}$, $g(x) = \frac{1}{x}$
 $D_f = D_g \rightarrow \frac{x}{x^2+1} = \frac{1}{x}$
 $x^2 = x^2 + 1$
 $0 = 1$
 $D_f = \emptyset$
 ه) $f(x) = \frac{x}{x^2+1}$, $g(x) = \frac{x}{x^2+1}$
 $D_f = D_g \rightarrow \frac{x}{x^2+1} = \frac{x}{x^2+1}$
 $x^2 = x^2$
 $0 = 0$
 $D_f = D_g = \mathbb{R}$
 و) $f(x) = \frac{x}{x^2+1}$, $g(x) = \frac{x}{x^2+1}$
 $D_f = D_g \rightarrow \frac{x}{x^2+1} = \frac{x}{x^2+1}$
 $x^2 = x^2$
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ز) $f(x) = \frac{1}{x}$, $g(x) = \frac{1}{x}$
 $D_f = D_g \rightarrow \frac{1}{x} = \frac{1}{x}$
 $x = x$
 $D_f = D_g = \mathbb{R} \setminus \{0\}$
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$$f(x) = \frac{bx+c}{ax+b} \quad g(x) = c \quad Dg = R - \{d\}$$

$$ax+b \neq 0 \Rightarrow d = -\frac{c}{a} \Rightarrow \frac{db}{c} = 0$$

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

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

$$\frac{f \circ g}{f \circ g} = \left\{ \begin{pmatrix} -1 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 4 \end{pmatrix}, \begin{pmatrix} 3 \\ -1 \end{pmatrix} \right\} \quad Rf = \{1, 3, 4\}$$

$$d = d = -1 \quad d - \frac{c}{a} = -1$$

$$c = d - \frac{c}{a} \quad \frac{c}{a} = -1$$

$$d + c = -1 + 0 = -1$$

$$f = \{(2, d), (-1, d + \frac{c}{a}), (c, d), (2, d)\}$$

$$g = \{(2, -1), (-1, -1), (d - \frac{c}{a}, d)\}$$

$$f(x) = \frac{ax+d}{x-c}, \quad g(x) = \frac{1}{x-c} \quad x-c \neq 0$$

$$= (x-c)^2 \left(\frac{ax+d}{x-c} \right)$$

$$\frac{ax+d}{x-c} = \frac{1}{x-c}$$

$$\frac{1}{(x-c)(x-c)}$$

$$x^2 + 9x + b = (x-c)^2$$

$$\frac{ax+d}{x-c} = x - \frac{c}{x-c} \quad b = 4 \Rightarrow c = 3$$

$$\Rightarrow ax+d = x^2 + 4x + 4$$

$$\Rightarrow d = 4$$

$$d + b + c = 4 + 4 + 3 = 11$$

$$= 11$$