

الف) $f(x) = \sqrt{x|x|}$, $g(x) = x$, $D_f = [0, \infty)$, $D_g = \mathbb{R}$ → ساری است

ب) $f(x) = \frac{(x+3)(x+1)+x+3}{x^2+3x+3}$, $g(x) = 1$ → ساری است $D_f = \mathbb{R}$, $D_g = \mathbb{R}$

ج) $f(x) = \frac{3\sin x - 4\sin 2}{2\sin x - 3}$, $g(x) = 2\sin x$ → $2\sin x - 3 \neq 0$ $D_f = \mathbb{R}$, $D_g = \mathbb{R}$

د) $f(x) = \frac{x}{|x|}$, $g(x) = \frac{|x|}{x}$ → $D_f = D_g = \mathbb{R} - \{0\}$

ه) $f(x) = \left[\frac{x^2}{x^2+1} \right]$, $g(x) = [x - [x]]$ → ساری

و) $f(x) = \frac{1}{[2x]}$, $g(x) = \frac{1}{2[x]}$ → $D_f \neq D_g$ $D_f = \mathbb{R} - [0, \frac{1}{2})$ $D_g = \mathbb{R} - [0, 1)$

ز) $f(x) = \frac{1}{\sqrt{x-|x|}}$, $g(x) = \frac{1}{\sqrt{|x|-x}}$ $D_f \neq D_g$ $D_f = \emptyset$ $D_g = \mathbb{R}^-$

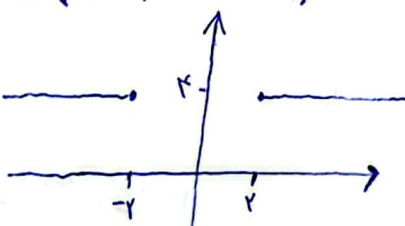
ح) $f(x) = \begin{cases} \frac{x^2-x}{2-1} & x \neq 1 \\ 2 & x = 1 \end{cases}$, $g(x) = x^2+x$ $D_f = D_g = \mathbb{R}$

$\begin{cases} f(x) - g(x) = x^2 - x + 1 \\ f(x) + g(x) = x^2 + x + 1 \end{cases} \rightarrow \begin{cases} 2f(x) = 2x^2 + 2 \\ f(x) = x^2 + 1 \end{cases}$

$f'(x) - g'(x) = (x^2+1)' - x^2 = x^2+1+2x^2-x^2 = x^2+x^2+1$

$f(x) = x - \sqrt{x^2-4}$, $g(x) = x + \sqrt{x^2-4}$ $f \cdot g = (x - \sqrt{x^2-4})(x + \sqrt{x^2-4}) = x^2 - (x^2-4) = 4$

$D_f = D_g = (-\infty, -2] \cup [2, \infty)$



$f(x) = \frac{ax+b}{x^2-mx+n}$, $g(x) = \frac{x-b}{2x^2-3x-d}$
 $m = \frac{3}{2}$, $n = \frac{-d}{2}$, $a = \frac{1}{2}$, $b = -4$

$am - bn = ?$, $\frac{3}{2} - b = \frac{-3}{2}$
 $f(x) = \frac{\frac{1}{2}(x-b)}{\frac{1}{2}(2x^2-3x-d)}$

$$f(x) = \frac{bx+y}{1x+b} \quad g(x) = C \quad Dg = R - \{a\} = Df$$

$$\begin{cases} C = \frac{1}{y} & b = 1 & a = -\frac{1}{y} \\ C = -\frac{1}{y} & b = -1 & a = \frac{1}{y} \end{cases}$$

$$\frac{bx+y}{1x+b} = C \quad bx+y = 1Cx + bC$$

$$\frac{ab}{c} = \pm 1$$

$$1x+b \neq 0 \quad x \neq -\frac{b}{1} \rightarrow a = -\frac{b}{1} \quad \begin{cases} b = 1C \\ bc = y \rightarrow 1C = y \end{cases} \quad C = \frac{1}{y} \quad C = \pm \frac{1}{y}$$

$$fg = \{(1,1), (2,2), (-1,-1), (0,0)\} \quad f+g = \{(1,1), (2,2), (-1,-1)\}$$

$$f = \{(-1,1), (2,2), (3,-1), (0, \frac{1}{y})\}$$

$$\frac{fg}{f+g} = \{(1,1), (2,2), (-1,2)\} \quad R_{\frac{fg}{f+g}} = \{1, 2, 2\}$$

$$f = \{(1,a), (-3, 3a-2b), (c,d), (1,d)\}$$

$$g = \{(1,-1), (-3,1), (a-3b,d)\}$$

$$\begin{aligned} a &= -1 & 3a-2b &= 1 & 3b &= -1 \\ d &= -1 & a-3b &= c & b &= -1 \\ & & & & c &= 2 \end{aligned}$$

$$d+c = ? \quad 2-1 = 1$$

$$f(x) = \sqrt{-x^2+x-m} \quad g(x) = \{(a,b)\} \quad a+b = ? \quad \frac{1}{y} + 0 = \frac{1}{y}$$

$$-x^2+x-m \geq 0$$

$$\Delta \geq 0 \quad n(Dg) = 1 \rightarrow \sqrt{1-4m} = 0$$

$$x = \frac{-1 \pm \sqrt{1-4m}}{-1} = \frac{1}{y} \quad \begin{aligned} 1-4m &= 0 \\ 4m &= 1 \\ m &= \frac{1}{4} \end{aligned} \quad b = 0 \quad a = \frac{1}{y}$$

$$f(x) = \frac{yx+a}{x^2+yx+b} \quad g(x) = \frac{y}{x-c} \quad a+b+c = ?$$

$$Df = Dg = R - \{c\}$$

$$\frac{yx+a}{x^2+yx+b} = \frac{y}{x-c}$$

$$\begin{aligned} a+b+c &= \\ y+9-3 &= 12 \end{aligned}$$

$$yx^2+1yx+1b = yx^2 - yc x + ax - ac$$

$$a-yc = 1 \quad a = 1+yc = 9$$

$$yb = -ac$$

$$f(x) \Delta = 0 \quad \sqrt{44-4b} = 0 \quad b = 9$$

$$(x+3)^2 \quad x \neq 3 \quad c = 3$$