

الف) $g(x) \rightarrow D_g = R$

$x|x| \geq 0 \rightarrow x \geq 0 \checkmark$

 $\rightarrow$ مساوی نیستند

$x = 0 \checkmark \rightarrow D_{(f)} = \{0\} \cup R^+$

$x < 0 \checkmark$

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ب) $\frac{x^2 + 4x + 4 + x + 4}{x^2 + 4x + 4} = 1, g(x) = 1$

 $\rightarrow$ مساوی هستند

$x^2 + 4x + 4 \neq 0 \rightarrow \Delta = 2d - 2a = -3$ و بیشه ندارد

ج) $f(x) = \frac{2\sin^2 x - 4\sin x}{2\sin x - 2} \rightarrow 2\sin x - 2 \rightarrow \sin x \neq 1 \rightarrow -1 < \sin x < 1 \rightarrow D_{(f)} = R$

 $D_{(g)} = R$ مساوی هستند

د) $f(x) = \frac{x}{|x|} \rightarrow x \neq 0 \quad g(x) = \frac{|x|}{x} \rightarrow x \neq 0 \quad D_f = R - \{0\} \quad x > 0 \rightarrow 1$

$D_g = R - \{0\} \quad x < 0 \rightarrow -1$ مساوی هستند

الف) $f(x) = \left[\frac{x^2}{x^2 + 1} \right] \rightarrow \frac{x^2}{x^2 + 1} \neq 0 \rightarrow x^2 \neq -1 \checkmark \begin{cases} x = 0 \rightarrow \left[\frac{0}{1} \right] = 0 \\ x \neq 0 \rightarrow \frac{x^2}{x^2 + 1} < 1 \rightarrow \left[\frac{x^2}{x^2 + 1} \right] = 0 \end{cases}$

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$g(x) = x - [x] \rightarrow 0 \leq x - [x] < 1 \rightarrow [x - [x]] = 0$

$0 \leq x - [x] < 1$

 $\rightarrow$ مساوی هستند

ب) $f(x) = \frac{1}{[2x]} \rightarrow [2x] \neq 0 \rightarrow D_f = R - [0, \frac{1}{2})$

$g(x) = \frac{1}{2[x]} \rightarrow [x] \neq 0 \rightarrow D_g = R - [0, 1)$

 $\left. \begin{array}{l} D_f \neq D_g \\ \text{مساوی نیستند} \end{array} \right\}$

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$$c) f(x) = \frac{1}{\sqrt{x-|x|}} \rightarrow x-|x| > 0 \text{ حيث } x > 0 \text{ لكي } D_f = \emptyset$$

 $D_f \neq D_g$ حيث $D_g = \mathbb{R}$

$$g(x) = \frac{1}{\sqrt{|x|-x}} \rightarrow |x|-x > 0 \rightarrow D_g = \bar{\mathbb{R}}$$

$$2) f(x) = \begin{cases} \frac{x^2-x}{x-1} & ; x \neq 1 \\ 2 & ; x = 1 \end{cases} \quad g(x) = x^2+x \quad g(1) = f(1) = 2$$

$$f(x \neq 1) = \frac{x(x-1)}{x-1} = x \quad \text{حيث } x \neq 1$$

$$g(x \neq 1) = x^2+x = x(x+1)$$

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

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

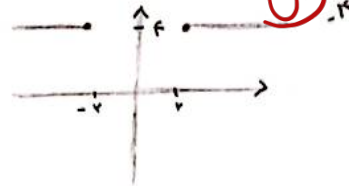
$$f(x) = x \rightarrow g(x) = x$$

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

$$f(x) + x = x^2+x+1 \rightarrow f(x) = x^2+1$$

$$f \circ g = (x - \sqrt{x^2-1})(x + \sqrt{x^2+1}) = x^2 - (x^2-1) = 1$$

$$D_f \circ D_g = (-\infty, -1] \cup [1, +\infty)$$



$$f(x) = \frac{ax+b}{x^2-mx+n} \rightarrow (x+1)(x-\frac{a}{f}) = x^2 - \frac{a}{f}x - \frac{a}{f} \quad m = \frac{a}{f} \quad n = -\frac{a}{f} \quad -a$$

$$g(x) = \frac{x-b}{x^2-rx-a} \quad x = \frac{a}{f} \quad x = -1 \quad rx^2-rx-a \neq 0 \rightarrow (rx-a)(x+1) \neq 0 \quad D_g = \mathbb{R} - \{-1, \frac{a}{f}\}$$

$$\frac{ax+b}{x^2-\frac{a}{f}x-\frac{a}{f}} = \frac{x-b}{x^2-rx-a} \quad \text{حيث } x \neq -1, b = -f$$

$$\frac{ax+b}{x^2-\frac{a}{f}x-\frac{a}{f}} = \frac{x-b}{x^2-rx-a} \quad \text{حيث } x = 1, a+f = 1+f = a \quad a = \frac{1}{f}$$

$$am - bn = \frac{1}{f} \times \frac{a}{f} - (-\frac{a}{f} \times -f) = -\frac{f^2}{f}$$

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$$\frac{bx+r}{ax+b} = c \rightarrow bx+r = acx+bx \rightarrow c = \frac{r}{x}$$

$$ad = bc \rightarrow b = 14 \quad b = 1f \quad b = 1f$$

$$ax+f \neq 0 \quad f(rx+1) \neq 0 \quad x \neq -\frac{1}{r} \quad \frac{ab}{c} = \frac{(-\frac{1}{r}) \cdot f}{\frac{1}{f}} = -f$$

$$ax-f \neq 0 \quad f(rx-1) \neq 0 \quad x \neq \frac{1}{r} \quad \frac{ab}{c} = \frac{(-\frac{1}{r}) \cdot (-f)}{\frac{1}{f}} = f$$

$$rf = \{(-1, f) (r, 1) (r, -f) (0, 1)\} \rightarrow f = \{(-1, r) (r, f) (r, -r) (0, \frac{1}{r})\}$$

$$\frac{rg}{f+g} = \begin{cases} x = -1 & \frac{-1}{-r} = f \\ x = r & \frac{1}{r} = 1 \\ x = r & \frac{r}{f} = r \end{cases} \quad R = f, 1, r$$

$$f = \{(r, a) (-r, ra-rb) (c, a) (r, d)\} \rightarrow a=d$$

$$g = \{(r, -1) (-r, 1) (a-rb, a)\} \quad \boxed{a+d=-1} \quad rx-1-rb = 1$$

$$\boxed{b=-r}$$

$$-1 - r(-r) = c \quad \boxed{c=a} \quad d+c = -1+a = \boxed{f}$$

$$-(x^2 - x + m) \geq 0 \rightarrow \text{مربع کامل رجون یک جواب} \rightarrow \sqrt{-(x-a)^2}$$

(r, b)

$$\rightarrow -x^2 + rax - a^2 = -x^2 + x - m \quad ra=1 \rightarrow a=\frac{1}{r} \quad b=0$$

$$-a^2 = -m \quad a+b = \frac{1}{r} + 0 = \frac{1}{r}$$

$$m = \frac{1}{r^2}$$

$$x=0 \rightarrow \frac{r}{-c} = \frac{a}{b} \quad rb = -ac \quad \frac{r}{x-c} = \frac{r(x+\frac{a}{r})}{(x-c)(x+\frac{a}{r})}$$

$$\frac{a}{r} - c = 4 \quad a - rc = 1r \quad D_f = D_g \rightarrow R - \{c, -\frac{a}{r}\} = R - \{c\} \rightarrow c = -\frac{a}{r}$$

$$-rc - rc = 1r \quad a = -rc$$

Elipon

$$-rc = 1r$$

$$c = -r$$

$$a = 4$$

$$b = 9$$

$$a+b+c = 4+9-13 = 1r$$