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الف) $f(x)=\sqrt{x|x|} \to x|x|\geq 0 \to \left\{\begin{array}{l} x>0 \checkmark \\ x=0 \checkmark \\ x<0 \times \end{array}\right\} \to D_f=\{0\}\cup R^+ ,\ D_g=R$ مساوی نیستند

ب) $f(x)=\frac{x^2+4x+3+x+4}{x^2+5x+7}=1$ و $g(x)=1 \to$ مساوی هستند

$x^2+5x+7\neq 0 \to \Delta=25-28=-3 \to$ ریشه ندارد

ج) $f(x)=\frac{4\sin^2x-6\sin x}{2\sin x-3} \to 2\sin x-3 \to \sin x\neq \frac{3}{2}>1,\ -1\leq \sin x\leq 1$ $D_f=R$, $D_g=R$ مساوی هستند

د) $f(x)=\frac{x}{|x|} \to x\neq 0,\ g(x)=\frac{|x|}{x} \to x\neq 0 \to D_f=R-\{0\},\ D_g=R-\{0\},\ \left.\begin{array}{l} x>0\to 1 \\ x<0\to -1\end{array}\right\}$ مساوی هستند

الف) $f(x)=\left[\frac{x^2}{x^2+1}\right] \to x^2+1\neq 0 \to x^2\neq -1 \to \checkmark \to \left\{\begin{array}{l} x=0 \to \left[\frac{0}{1}\right]=0 \\ x\neq 0 \to \frac{x^2}{x^2+1}<1 \to \left[\frac{x^2}{x^2+1}\right]=0 \end{array}\right.$ مساوی هستند

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

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

ج) $f(x)=\frac{1}{\sqrt{x-|x|}} \to x-|x|>0 \to$ امکان‌پذیر ندارد $\to D_f=\varnothing$

$g(x)=\frac{1}{\sqrt{|x|-x}} \to |x|-x>0 \to D_g=R^-$ مساوی نیست

د) $f(x)=\left\{\begin{array}{l} \frac{x^3-x}{x-1} ; x\neq 1 \\ 2 ; x=1 \end{array}\right.$, $g(x)=x^2+x \to g(1)=f(1)=2$, $f(x\neq 1)=x(x+1)=\frac{x(x-1)(x+1)}{x-1}$

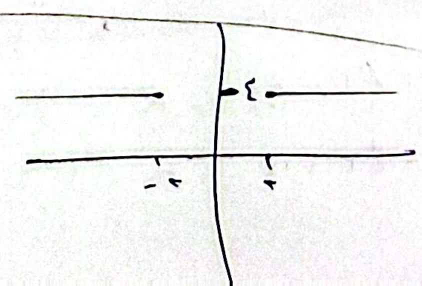
$g(x\neq 1)=x^2+x=x(x+1)$

مساوی هستند

$$\left\{\begin{array}{l} f(x)+g(x)=x^2+x+1 \\ f(x)-g(x)=x^2-x+1 \\ \hline 2g(x)=2x \to g(x)=x \\ f(x)+x=x^2+x+1=x^2+1 \end{array}\right.$$

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

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



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

$f(x) = \frac{8x+2}{x^2 - mx + n} \to (x+1)(x - \frac{5}{2}) = x^2 - \frac{3}{2}x - \frac{5}{2} \to m = \frac{3}{2},\ n = -\frac{5}{2}$

$2x - 5 = 0 \to x = \frac{5}{2}$

$x+1=0,\ x=-1$

$g(x) = \frac{x-b}{2x^2-3x-5} \to 2x^2 - 3x - 5 \neq 0 \to (2x-5)(x+1) \neq 0 \to D_g = R - \{-1, \frac{5}{2}\}$

$\frac{8x+2}{x^2 - \frac{3}{2}x - \frac{5}{2}} = \frac{x-b}{2x^2-3x-5} \to 2ax + 4 = x - b \xrightarrow{x=0} b = -4$

$2ax + 4 = x - b \xrightarrow{x=1} 2a + 4 = 1 + 4 = 5 \to a = \frac{1}{2}$

$\underline{8m - bn} = \frac{1}{2} \times \frac{3}{2} - (-\frac{5}{2} \times (-4)) = -\frac{37}{4}$

$\frac{bx+2}{8x+b} = c \to bx + 2 = 8cx + bc \begin{cases} c = \frac{1}{2} \\ b = \pm 4 \end{cases}$

$ad = bc \to b^2 = 16 = \pm 4$

$8x + 4 \neq 0 \to 4(2x+1) = 0 \to x \neq -\frac{1}{2} \to \frac{ab}{c} = \frac{(-\frac{1}{2}) \times 4}{\frac{1}{2}} = -4$

$8x - 4 \neq 0 \to 4(2x-1) = 0 \to x \neq \frac{1}{2} \to \frac{ab}{c} = \frac{(-\frac{1}{2}) \times (-4)}{\frac{1}{2}} = 4$

$2f = \{(-1, 4), (2, 8)(3, -4)(0, 1)\} \to f = \{(-1, 2)(2, 4)(3, -2)(0, \frac{1}{2})\}$

$\frac{2g}{fg} \begin{cases} x = -1 \to \frac{-8}{-2} = 4 \\ x = 2 \to \frac{8}{8} = 1 \\ x = 3 \to \frac{12}{4} = 3 \end{cases} \to R = 4, 1, 3$

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

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

$a = -1 = d \Rightarrow 3(-1) - 2b = 1 \to b = -2$

$-1 - 3(-2) = c \to c = 5$

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

$-(x^2 - x + m) \geq 0 \to$ فقط یک $\to \sqrt{-(x-a)^2} = 0 \quad -x^2 + 2ax - a^2 = -x^2 + x - m \to$

[illegible] جواب دارد

$-x^2 = -m$

$x = \frac{1}{4}$

$2a = 1 \to a = \frac{1}{2} \to b = 0 \to a + b = \frac{1}{2} + 0 = \frac{1}{2}$

$x = 0 \to \frac{2}{-c} = \frac{x}{b} \to 2b = -8c$

$\frac{2}{x - c} = \frac{2(x + \frac{x}{2})}{(x-c)(x + \frac{a}{2})} \to \frac{a}{2} - c = 6 \to a - 2c = 12$

$D_f = D_g \Rightarrow R - \{c, -\frac{a}{2}\} = R - \{c\} \to c = -\frac{a}{2} \to a = -2c \to -2c - 2c = 12$

$-4c = 12 \to c = -3 \quad m = 6,\ b = 9 \to a + b + c = 6 + 9 - 3 = 12$