نام و نام خانوادگی ...پردیا رحمانی... پاسخنامه تشریحی تکلیف شماره ..۸... کلاس ...دهم ریاضی B...

۱

الف) $f(x)=\sqrt{x|x|}\ ,\ g(x)=x$

$x|x|\quad x\geq 0 \qquad D_f=[0,+\infty] \Rightarrow$

$D_g=\mathbb{R} \Rightarrow \qquad D_f\neq D_g \quad D_f\neq D_g$

ب) $f(x)=\dfrac{(x+3)(x+1)+x+4}{x^2+5x+7}\ ,\ g(x)=1$

x^2+4x+3

$D_f=\dfrac{x^2+5x+7}{x^2+5x+7}=\{1\} \quad D_g=\{1\}\rightarrow$

$D_f=D_g \Rightarrow f(x)=g(x)$

ج) $f(x)=\dfrac{4\sin^2 x-6\sin x}{2\sin x-3}\ ,\ g(x)=2\sin x$

$D_f=\dfrac{2\sin x(2\sin x-3)}{2\sin x-3} \quad 2\sin x\rightarrow \qquad f(x)=g(x)$

$D_g=2\sin x \longrightarrow D_f=D_g$

د) $f(x)=\dfrac{x}{|x|}\ ,\ g(x)=\dfrac{|x|}{x}$

$D_f=\mathbb{R}-\{0\}$

$D_g=\mathbb{R}-\{0\}$ $\Rightarrow D_f=D_g$

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

۲

الف) $f(x)=\left[\dfrac{x^2}{x^2+1}\right]\ ,\ g(x)=[x-[x]]$

$D_f=\mathbb{R} \qquad D_f=D_g \quad f(x)=g(x)$

$D_g=\mathbb{R}$

ب) $\rightarrow f(x)=\dfrac{1}{[2x]}\ ,\ g(x)=\dfrac{1}{2[x]}$

$D_f=0\leq 2x<1\Rightarrow 0\leq x<\frac{1}{2}$ $\Big]\ D_f\neq D_g$

$D_g\neq 0\leq x<1$

$f(x)\neq g(x)$

ج) $f(x)=\dfrac{1}{\sqrt{x-|x|}}\ ,\ g(x)=\dfrac{1}{\sqrt{|x|-1}}$

$D_f=\begin{cases} x>0\rightarrow x\,x \\ x=0\rightarrow x \\ x<0\rightarrow x\ \text{تعریف نشده} \end{cases} \qquad D_g=\begin{cases} x>0\rightarrow 0\,x \\ x=0\rightarrow -x \\ x<0\checkmark \end{cases}$

د) $f(x)=\dfrac{x^3-x}{x-1}\ ,\ g(x)=x^2+x$

$x^2+x=2 <\begin{matrix} x=1 \\ x=2\end{matrix} \qquad D_f=D_g$

$f(x)=g(x)$

$x^2-x=\dfrac{x^3-x}{x-1}\rightarrow x^2-x=x^2-x\checkmark$

۳

$\left.\begin{matrix} f(x)+g(x)=x^2+x+1 \\ f(x)-g(x)=x^2+x+1 \end{matrix}\right\}\longrightarrow 2f(x)=2x^2+2$

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

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

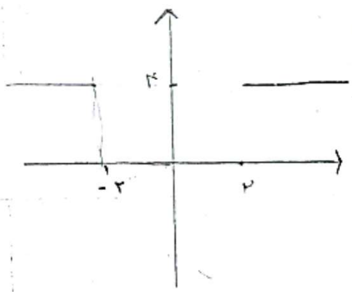
۴

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

$D_f=D_g\longrightarrow x^2-4\geq 0\longrightarrow x^2\geq 4$

$x\geq 2$

$x\leq -2$



۵

$g(x)=\dfrac{x-b}{2x^2-3x-5} \longrightarrow (g=f)$

$f(x)=\dfrac{2\times\ ax+2}{2\times x^2-mx+n}=\dfrac{2ax+4}{2x^2-2mx+2n}$

$2ax=x\rightarrow 2a=1\rightarrow a=\frac{1}{2}$

$-2mx=-3x\rightarrow -2m=-3\rightarrow \boxed{m=\frac{3}{2}}$

$-b=4\longrightarrow \boxed{b=-4}$

$2n=-5\rightarrow n=-\frac{5}{2}$

$am-bn=\frac{1}{2}\times\frac{3}{2}-(\cancel{-4}\times\cancel{-\tfrac{5}{2}})=-9{,}25$

$g(x)=c$

$f(x)=\dfrac{bx+2}{8x+b}$

$b=4 \to \dfrac{4x+2}{8x+4}=\dfrac{1}{2} \to \dfrac{ab}{c}=\dfrac{-\frac{1}{2}\times 4}{\frac{1}{2}}=-4$

$b=-4 \to \dfrac{-4x+2}{8x-4}=-\dfrac{1}{2} \to \dfrac{ab}{c}=\dfrac{\frac{1}{2}\times -4}{-\frac{1}{2}}=4$ $\quad c=\pm\frac{1}{2}$

$g(x)=f(x) \longrightarrow c=\dfrac{bx+2}{8x+b} \to bx+2=8cx+cb \to cb=2$ ۶

$b=8c \to c=\dfrac{b}{8} \longrightarrow bc=\left(\dfrac{b}{8}\right)b=\dfrac{b^2}{8}=2 \longrightarrow b^2=16 \begin{cases} b=4 \\ b=-4 \end{cases}$

$f^{-1}=\{(-1,2),(2,7),(3,-5),(0,0)\} \to f=\{(-1,2),(2,3),(3,-2),(0,\frac{1}{2})\}$

$g=\{(2,4),(3,6),(-1,-4),(5,0)\}$

$\dfrac{2g}{f+g}=\dfrac{\{(-1,-8),(2,8),(3,6),(5,0)\}}{\{(-1,-2),(2,8),(3,4)\}}=\{(-1,4),(2,1),(3,\frac{3}{2})\}$ ۷

$R_{\frac{2g}{f+g}}=\{4,1,\frac{3}{2}\}$

$f=\{(3,a),(-3,3a-b),(c,5),(3,d)\} \Rightarrow a=d=-1$

$g=\{(3,-1),(-3,1),(a-3b,5)\}$ $\quad 3a-2b=1 \to -3-2b=1 \to -2b=4 \Rightarrow b=-2$

$f=g$ $\quad a-3b=c$ ۸

$c=-1+6=5$

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

$f(x)=\sqrt{-x^2+x-m} \longrightarrow -(x^2-x+m)\geq 0 \xrightarrow{\text{مربع کامل}} -x^2+x-\frac{1}{4}\geq 0$

$b=\sqrt{-\frac{1}{4}+\frac{1}{2}-\frac{1}{4}}=\sqrt{0}=0$ $\quad x^2-x+\frac{1}{4}\geq 0$ ۹

$(x-\frac{1}{2})^2\leq 0 \to x=\frac{1}{2} \to a=\frac{1}{2}$

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

$f(x)=\dfrac{2x+a}{x^2+6x+b}=g(x)=\dfrac{2}{x-c} \longrightarrow f(x)=\dfrac{2x+a}{(x+\frac{a}{2})(x-c)} \Rightarrow D_f=\mathbb{R}-\{c,-\frac{a}{2}\}$

$D_f=D_g \to D_g=\mathbb{R}-\{c\} \to c=-\frac{a}{2} \to (2x+a)(x-c)=2x^2+12x+b \to 2x^2+(a-2c)x-ac$ ۱۰

$=2x^2+12x+2b \to a-2c=12$

$-ac=2b \to b=\dfrac{-ac}{2}=\dfrac{-2c^2-12c}{2}$ $\quad b=c^2-6ca=-2c=2c+12$ $\quad \boxed{c=-3}$

$a+b+c=(2c+12)+(-c^2-6c)+c \Rightarrow 6+9-3=\boxed{12}$