نام و نام خانوادگی: رها موسوی — پاسخنامه تشریحی تکلیف شماره ۵ — دهم ریاضی A

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**۱**

الف) $f(x)=\sqrt{x|x|}\,,\ g(x)=x \longrightarrow x|x|\geqslant 0 \longrightarrow x\geqslant 0 \Longrightarrow D_f=[0,+\infty),\ D_g=\mathbb{R} \Longrightarrow \boxed{f(x)\neq g(x)}$

ب) $f(x)=\dfrac{(x+3)(x+1)+x+4}{x^2+5x+7}\,,\ g(x)=1 \rightarrow f(x)=\dfrac{x^2+5x+7}{x^2+5x+7}=1\,,\ D_f=\mathbb{R}\,,\ D_g=\mathbb{R} \Longrightarrow \boxed{f(x)=g(x)}$

$\hookrightarrow \Delta<0$

ج) $f(x)=\dfrac{4\sin^2 x-6\sin x}{2\sin x-3} \rightsquigarrow g(x)=2\sin x \rightsquigarrow D_f=\mathbb{R}\,,\ D_g=\mathbb{R}\,,\ f(x)=\dfrac{2\sin x(2\sin x-3)}{2\sin x-3}=2\sin x \Longrightarrow \boxed{f(x)=g(x)}$

د) $f(x)=\dfrac{x}{|x|}\,,\ g(x)=\dfrac{|x|}{x} \rightsquigarrow f(x)=\pm 1\,,\ g(x)=\pm 1\,,\ D_f=D_g=\mathbb{R}-\{0\} \Longrightarrow \boxed{f(x)=g(x)}$

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**۲**

الف) $f(x)=\left[\dfrac{x^2}{x^2+1}\right],\ g(x)=[x-[x]] \longrightarrow f(x)=0\ \left(0\leqslant \dfrac{x^2}{x^2+1}<1\right),\ g(x)=0,\ D_f=D_g=\mathbb{R} \longrightarrow \boxed{f(x)=g(x)}$

ب) $f(x)=\dfrac{1}{[2x]}\,,\ g(x)=\dfrac{1}{2[x]} \longrightarrow D_f=[0,\tfrac{1}{2}),\ D_g=\mathbb{R}-[0,1),\ \dfrac{1}{[2x]}\neq\dfrac{1}{2[x]} \longrightarrow \boxed{f(x)\neq g(x)}$

ج) $f(x)=\dfrac{1}{\sqrt{x-|x|}}\,,\ g(x)=\dfrac{1}{\sqrt{|x|-x}} \longrightarrow x-|x|>0 \rightsquigarrow D_f=\varnothing\,,\ |x|-x>0 \rightsquigarrow x<0 \rightsquigarrow D_g=(-\infty,0) \rightarrow \boxed{f(x)\neq g(x)}$

د) $f(x)=\begin{cases}\dfrac{x^3-x}{x-1} & ; x\neq 1\\ 2 & ; x=1\end{cases}\,,\ g(x)=x^2+x \rightsquigarrow \dfrac{x^3-x}{x-1}=\dfrac{x(x-1)(x+1)}{x-1}=x^2+x \longrightarrow \boxed{f(x)=g(x)}$

$D_f=D_g=\mathbb{R}$

* تنها عددی که ضابطه اول را تعریف نشده می‌کند، شامل تابع نیست.

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**۳**

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

$\hookrightarrow \boxed{g(x)=x}$

$f^2(x)-g^2(x)=(x^2+1)^2-x^2=x^4+1+2x^2-x^2=\boxed{x^4+x^2+1}$

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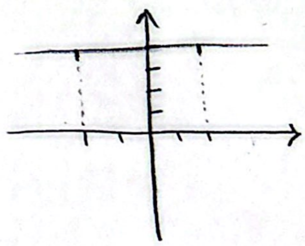
**۴**

$f(x)=x-\sqrt{x^2-4} \rightsquigarrow x^2-4\geqslant 0 \rightsquigarrow x\geqslant 2\ ,\ x\leqslant -2$

$g(x)=x+\sqrt{x^2-4} \rightsquigarrow x\geqslant 2\ ,\ x\leqslant -2$

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



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**۵**

$\dfrac{ax+2}{x^2-mx+n}=\dfrac{x-b}{2x^2-3x-5} \rightsquigarrow \dfrac{2ax+4}{2x^2-2mx+2n}=\dfrac{x-b}{2x^2-3x-5} \rightsquigarrow \begin{cases}2a=1 \rightsquigarrow a=\frac{1}{2}\ ,\ -b=4\rightarrow b=-4\\ 2m=3 \rightsquigarrow m=\frac{3}{2}\ ,\ 2n=-5\rightarrow n=-\frac{5}{2}\end{cases}\ am-bn=$

$am-bn=\longrightarrow \dfrac{3}{4}-10=\boxed{\dfrac{-37}{4}}$

$8x+b\neq 0 \rightsquigarrow x\neq \frac{-b}{8} \rightsquigarrow a=\frac{-b}{8} \,,\, \frac{bx+2}{8x+b}=c \rightsquigarrow bx+2=8cx+bc \rightsquigarrow b=8c \,,\, bc=2$ 6

$\star\ 8c^2=2 \rightsquigarrow c=\pm\frac{1}{2} \,/\, b=\pm 4 \,/\, a=\pm\frac{1}{2}$

$\boxed{\frac{ab}{c}=\pm 4}$

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

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

$\frac{2g}{f+g}=\{(-1,4),(2,1),(3,3)\}$ 7

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$f=\{(2,a),(-3,3a-2b),(c,5),(2,d)\}$

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

$a=(-1)$, $b=(-2)$, $c=5$, $d=(-1)$ $\rightsquigarrow d+c=(-1)+5=\boxed{4}$ 8

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$b=0 \longrightarrow 1-4m=0 \rightsquigarrow m=\frac{1}{4} \rightsquigarrow a=\frac{1}{2} \longrightarrow a+b=\frac{1}{2}+0=\boxed{\frac{1}{2}}$ 9

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$\frac{2x+a}{x^2+6x+b}=\frac{2}{x-c} \rightsquigarrow 2x^2-2xc+ax-ac=2x^2+12x+2b \rightsquigarrow -2c+a=12 \,,\, -ac=2b$ 10

$\frac{2(x+\frac{a}{2})}{(x+\frac{a}{2})(x-c)}=\frac{2}{x-c} \rightsquigarrow c=\frac{-a}{2} \rightsquigarrow a+a=12 \longrightarrow a=6,\ c=(-3),\ b=9 \rightsquigarrow \boxed{a+b+c=12}$

$\boxed{a+b+c=12}$