نام و نام خانوادگی ...عرفان یزدی... پاسخنامه تشریحی تکلیف شماره ..۸.. کلاس ..دهم..........

الف) $x|x|\geq 0 \Rightarrow x\geq 0 \Rightarrow D_f=[0,+\infty) , D_g=\mathbb{R} \Rightarrow D_f\neq D_g$

ب) $(x+3)(x+1)=x^2+4x+3 \Rightarrow \frac{\cancel{x^2+4x+3+x+4}}{x^2+5x+7}=1 \Rightarrow f(x)=1=g(x)$ ۱

ج) $4\sin^2 x-6\sin x=2\sin x(2\sin x-3) \Rightarrow \frac{2\sin x(2\sin x-3)}{\cancel{2\sin x-3}}=2\sin x \Rightarrow f(x)=g(x)=2\sin x$

د) $D_f=\mathbb{R}-\{0\}\quad D_g=\mathbb{R}-\{0\} \Rightarrow \begin{cases} f(x)=g(x) & \text{if } x>0 \\ -f(x)=g(x) & \text{if } 0>x \end{cases}$

الف) $x^2+1\neq 0 \Rightarrow x^2\neq 1 \Rightarrow x\neq \pm 1 \Rightarrow x^2\geq 0 \quad 0\leq \frac{x^2}{x^2+1}<1 \Rightarrow \overset{\text{جزء صحیح}}{f(x)}=0$

$0\leq x-[x]<1 \Rightarrow \overset{\text{جزء صحیح}}{g(x)}=0 \Rightarrow f(x)=0=g(x)$

ب) $2x\neq 0 \Rightarrow x\neq 0 \quad \begin{cases} [2x]=2[x] & \text{if } x<0 \\ [2x]=2[x] & \text{if } 0<x \end{cases} \Rightarrow g(x)=f(x)$ ۲

ج) $\left.\begin{aligned} x-|x|>0 &\Rightarrow x>|x| \\ |x|-x>0 &\Rightarrow |x|>x \end{aligned}\right\} \Rightarrow g(x)\neq f(x)$

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

$2f(x)=(x^2+x+1)+(x^2-x+1)=2x^2+2 \Rightarrow f(x)=x^2+1$

$2g(x)=(x^2+x+1)-(x^2-x+1)=2x \Rightarrow g(x)=x$

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

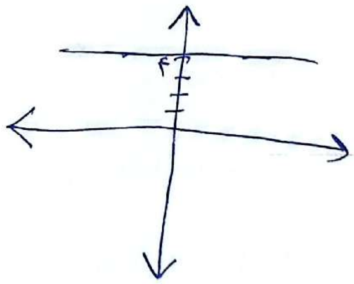
$f^2(x)-g^2(x)=(x^2-x+1)(x^2+x+1)$ ۳

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

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

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

$f(x)\cdot g(x)=x^2-(x^2-4)=4 \Rightarrow f\times g=y=4 \Rightarrow$ ۴



$x^2-mx+n=k(2x^2-3x-5) \quad 1=2k \Rightarrow k=\frac{1}{2} \quad -m=-3k=-\frac{3}{2} \Rightarrow m=\frac{3}{2}$

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

$ax+2=k(x-b)=\frac{1}{2}(x-b)=\frac{1}{2}x-\frac{b}{2}$ ۵

$a=\frac{1}{2} \quad 2=-\frac{b}{2} \Rightarrow b=-4 \quad am-bn=(\frac{1}{2})(\frac{3}{2})-(-4)(-\frac{5}{2})=\frac{3}{4}-10=-\frac{37}{4}$

تعدادی از سوالات اشتباها جابجا نوشته شده

$D_f = \mathbb{R} - \{\frac{-b}{8}\} \Rightarrow D_f = D_g \Rightarrow -\frac{b}{8} = a \rightarrow \boxed{8a = -b}$

$8x + b \neq 0 \rightarrow x \neq \frac{-b}{8}$

$\frac{bx+2}{8x+b} = c \Rightarrow (8x+b)c = bx+2 \rightarrow 8xc + bc = bx + 2 < \begin{matrix} 8c\cancel{x} = b\cancel{x} \\ bc = 2 \end{matrix}$

$\begin{matrix} \boxed{b = 8c} \\ \boxed{b = \frac{2}{c}} \end{matrix} > 8c = \frac{2}{c} \rightarrow 2 = 8c^2 \rightarrow c^2 = \frac{2}{8} = \frac{1}{4} \rightarrow \boxed{c = \frac{1}{2}} \quad \boxed{b = 4} \quad \boxed{a = -\frac{1}{2}}$

$\frac{ab}{c} = -\frac{1}{\cancel{2}} \times 4 \times \cancel{2} = -4$

$a = d \quad g(2) = -1 = f(2) \quad a = d = -1$

$2(-1) - b = 1 \Rightarrow -2 - b = 1 \Rightarrow b = -3$

$c = a - 3b = -1 - 3(-3) = -1 + 9 = 8$ $\boxed{8}$

$c + d = 8 + (-1) = \boxed{7}$

$D_g = \mathbb{R} - \{c\}$

$\frac{2x+a}{x^2+6x+b} = \frac{2}{x-c} \rightarrow (2x+a)(x-c) = \cancel{2x^2} + 12x + 2b \rightarrow (-2c+a)x - ac = 12x + 2b$

$\cancel{2x^2} - 2xc + xa - ac$

$\boxed{10}$

$\rightarrow -2c + a = 12 \rightarrow \boxed{a = 12 + 2c} \ , \ -ac = 2b \rightarrow \boxed{b = \frac{-ac}{2}}$

$b = -\frac{(12+2c)c}{2} \rightarrow b = -6c - c^2 \rightarrow 9 = c(-6-c) \rightarrow \boxed{c = 3} \ , \ \boxed{b = 9}$

$\boxed{a = 18} \Rightarrow \boxed{a + b + c = 18 + 9 + 3 = 30}$

$f \cap g(x) \Rightarrow \{(a,b)\} \Rightarrow f(a) = b \quad f(x) = \sqrt{-x^2+x-m} \quad b = f(a) = \sqrt{-a^2+a-m}$

$-x^2 + x - m \geq 0 \quad -x^2 + x - m = 0 \Rightarrow x^2 - x + m = 0$

$\Delta = 0 \Rightarrow -x^2 + x - m = 0 \quad (-1)^2 - 4(1)(m) = 0 \Rightarrow 1 - 4m = 0 \Rightarrow m = \frac{1}{4}$

$m = \frac{1}{4} \quad x^2 - x + m = 0 \quad x = \frac{1}{2} \quad b = f(a) = \sqrt{-a^2+a-m} \quad b = \sqrt{-(\frac{1}{2})^2 + \frac{1}{2} - \frac{1}{4}} = \sqrt{0} = 0$

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

$2f - 1 = \{(-1,3)(2,7)(3,-5)(0,0)\} \rightarrow f = \{(-1,2)(2,4)(3,-2)(0,1)\}$

$g = \{(2,4)(3,6)(-1,-4)(5,0)\} \rightarrow 2g = \{(2,8)(3,12)(-1,-8)(5,0)\}$ $\boxed{7}$

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