نام و نام خانوادگی ...... [illegible] ...... پاسخنامه تشریحی تکلیف شماره ۸ ..... کلاس ......

۱

ج) $2\sin x - 3 \neq 0$

$\sin x \neq \frac{3}{2} \Rightarrow D_f = \mathbb{R}$

$D_g = \mathbb{R}$

مساوی است

$-1 \le \sin x \le 1$

$-2 \le 2\sin x$ ...

د) $D_f = \mathbb{R} - \{0\}$ ، $|x| \neq 0$

$D_g = \mathbb{R} - \{0\}$ ، $x \neq 0$

مساوی است

الف) $\sqrt{x|x|}$

$\Rightarrow D_f = [0, +\infty)$

$D_g = \mathbb{R} \Rightarrow$ برابر نیستند X

ب) $(x+3)(x+1)$

$\frac{(x+3)(x+1)+x+4}{x^2+4x+3+x+4} \Rightarrow$ برابر است ✓

۲

الف) $f(x) = \left[\frac{x^2}{x^2+1}\right] = 0$ ، $D_f = \mathbb{R}$

$x^2+1 > x^2$ همواره برابر صفر

$g(x) = [x-[x]] = 0$ همواره ، $D_g = \mathbb{R}$

مساوی است

ج) $f(x) \Rightarrow x - |x| > 0 \Rightarrow x > |x|$ ، $D_f = \emptyset$

$g(x) \Rightarrow |x| > x \Rightarrow D_g = (-\infty, 0)$

برابر نیستند

ب) $f(x) = \frac{1}{[2x]}$

$[2x] \neq 0 \Rightarrow D_f = \mathbb{R} - [0, \frac{1}{2})$

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

مساوی نیستند

د) $D_f = \mathbb{R} \Rightarrow \frac{x^3 - x}{x-1} \Rightarrow \frac{x\cancel{(x-1)}(x+1)}{\cancel{x-1}} = x^2+x$

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

$D_g = \mathbb{R}$

$\Rightarrow$ برابر است

۳

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

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

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

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

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

۴

$\underbrace{(x + \sqrt{x^2-4})(x - \sqrt{x^2-4})}_{\text{مزدوج}} \Rightarrow x^2 - x^2 + 4 = \boxed{4}$

۵

$\frac{x-b}{2x^2-3x-5} = 2\left(\frac{ax+2}{x^2-mx+n}\right) \Rightarrow 2x^2 - 3x - 5 = 2(x^2 - mx + n) \Rightarrow m = \frac{3}{2}, n = \frac{5}{2}$

$2x^2 - 2mx + n$

$2ax + 4 = x - b$

$\Rightarrow b = -4$

$2a = 1 \Rightarrow a = \frac{1}{2}$

$\left(\frac{1}{2} \times \frac{3}{2}\right) - 10 = \boxed{\frac{-37}{4}}$

$f(x) = \frac{bx+2}{8x+b}$ $\quad g(x) = c \to D_g = \mathbb{R} - \{a\}$ $\quad a = \frac{-b}{8} \Rightarrow a = \pm\frac{1}{2}$ $\quad \frac{ab}{c} = ?$

$\frac{bx+2}{8x+b} = c$ $\quad \to 8x+b \neq 0$, $\quad 8x \neq -b \Rightarrow x \neq \frac{-b}{8}$

$\to bx+2 = 8cx+bc \Rightarrow 8c^2 = 2$

$\to 8c = b,\ bc = 2$ $\quad c^2 = \frac{1}{4} \Rightarrow c = \pm\frac{1}{2}$

$8(\pm\frac{1}{2}) = b$, $\quad b = \pm 4$

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

$\pm\frac{1}{2} \times \pm 4 = \pm 2$, $\quad \frac{\pm 2}{\pm\frac{1}{2}} = \pm 4$ 6

$f = \{(-1,2)(2,4)(3,-2)(0,\frac{1}{2})\}$ $\quad 2g = \{(2,8)(3,12)(-1,-8)(0,0)\}$

$\frac{2g}{g+f} = ?$ 7

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

$\to$ برد $= R = \{1,3,4\}$

$3a - 2b = 1$ $\quad a = d = -1$ $\quad a - 3b = c$ $\quad d + c = ?$

$-3 - 2b = 1 \Rightarrow b = -2$ $\quad , -1 + 6 = c = 5$

$c + d = 5 - 1 = \boxed{4}$ 8

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

$\to -(x^2-x+m) \geq 0 \Rightarrow x^2-x+m \leq 0$

$\to \Delta = b^2 - 4ac = 1 - 4m = 0 \Rightarrow m = \frac{1}{4} = x$ ریشه

پس تک جواب داره ← چون Δ صفر

در تابع جایگذاری

$g(x) = \{(\frac{1}{2}, 0)\}$

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

$f(\frac{1}{2}) = \sqrt{-\frac{1}{4}+\frac{1}{2}-\frac{1}{4}} = 0 = b$ 9

$f(x) = \frac{2x+a}{x^2+6x+b}$ $\quad g(x) = \frac{2}{x-c}$ $\quad a+b+c = ?$

$x^2+6x+9 = (x+3)^2$

$\to \Delta = 0$

$\to x - c \neq 0 \Rightarrow x \neq c \Rightarrow \Delta \to c = -3$

ریشه مضاعف دارد

$\frac{2x+a}{x^2+6x+b} = \frac{2}{x-c} \Rightarrow$ $\quad b^2 - 4ac = 0 \Rightarrow 36 - 4(b) = 0 \Rightarrow \boxed{b = 9}$

$2x^2 + x(-2c+a) - ac = 2x^2 + 12x + 2b$

$-2c + a = 12 \Rightarrow a = 12 + 2c$

$2b = -ac \Rightarrow \boxed{a = 6}$

$a + b + c = 6 + 9 - 3 = 12$ 10