Name: _____ **Date**: _____ **Period**:_____

Instructions: Do all your work on this paper. Show all work necessary to reach your answer.

$(f+g)(x) = f(x)+g(x)$
$(f-g)(x) = f(x)-g(x)$
$(f \cdot g)(x) = f(x)\cdot g(x)$
$(f/g)(x) = \dfrac{f(x)}{g(x)}$ assuming $g(x) \neq 0$

Objective 1: **State the domain of each function below**. Remember, the domain always starts as {reals} and gets modified for values of *x* that make the function "blow up" (be not a real number). This includes dividing by zero or taking the square root of a negative number.

(a) $f(x) = x^3 + 2$ (b) $g(x) = \dfrac{2}{x+3}$ (c) $h(x) = \dfrac{2x}{x^2+3}$

(d) $f(x) = \sqrt{2x-1}$ (e) $G(x) = \dfrac{2x^2+3}{(x-1)(x+2)}$ (f) $g(x) = \dfrac{4}{|5-x|}$

Objective 2: **Evaluate the indicated function** given $f(x) = x^2 + 1$ and $g(x) = x - 4$.

(a) $(f+g)(3)$ (b) $(f-g)(-2)$

Evaluate the indicated function given $f(x) = x^2 + 1$ and $g(x) = x - 4$.

(c) $(f \cdot g)(4)$ (d) $(f / g)(6)$

<u>Objective 3</u>: **Evaluate the composition** specified below for the two functions $f(x) = x^2 + 1$ and $g(x) = 3 - x$.

(a) $f(g(3))$ (b) $f(g(-4))$ (c) $g(f(2))$

(d) $g(f(-2))$ (e) $f(f(3))$ (f) $f\left(2 \cdot g\left(1\right)\right)$

(g) $g(3 \cdot f(-2))$