Name: _____ Date: _____

Instructions: Please complete the following problems.

Problem 1. Find the domain: $f(x) = \frac{1}{x^2-9}$

Problem 2. Find the domain: $f(x) = \sqrt{x-8}$

Problem 3. Find the domain: $g(x) = \dfrac{3x}{\sqrt{3-x}}$

Problem 4. Given $f(x) = x^3 + 2x^2 - 3x + 1$ and $g(x) = \dfrac{16}{\sqrt{x^2}}$, find $f(g(4))$

Problem 5. Given the function $f(x) = x^2 + 3$ with domain $x = [-2, 3]$, what is the range of the function in this interval?

Problem 6. Find the average rate of change of the function as x changes from a to b given $f(x) = 2x^2 + 2$, $a = 1$, $b = 5$

Problem 7. Find the average rate of change of the function as x changes from a to b given $f(x) = x^2 + 2x - 4$, $a = -2$, $b = 2$

Problem 8. Find and simplify the difference quotient of: $f(x) = 4x + 6$

Problem 9. Find and simplify the difference quotient of: $f(x) = -2x^2 + 2x$