Quiz **Name**

1. Use the power and chain rules to compute the derivative of $f(x) = (1-x^2)^{-3}$. For what values(s) of x is $f'(x) = 0$? For what values(s) of x is $f'(x)$ undefined?

2. Use the limit definition of the derivative to determine the derivative of the function $f(x) = \dfrac{1}{x^2}$.

3. Consider the function $y = (x+1)^2$ for $x \leq -1$ and the function $y = (x-1)^2$ for $1 \leq x$. How many functions $f(x)$ of the form $f(x) = ax^3 + bx^2 + c$ are there such that the function $g(x)$ defined by:

$$g(x) = (x+1)^2 \text{ for } x \leq -1, \ g(x) = f(x) \text{ for } -1 \leq x \leq 1, \text{ and } g(x) = (x-1)^2 \text{ for } 1 \leq x$$

is differentiable for all x.