Name:_____

MA 2310 Quiz 4

Compute the following. No calculators.

1. $\lim_{x \to 0} \frac{1 - \cos(2x)}{x^2}$

2. Is the function below continuous at the point $x = 2$. Why or why not?

$$f(x) = \begin{cases} x^2 - 1 & : x < 2 \\ 1 + x & : x \geq 2 \end{cases}$$

3. What value should c be to make the following conntinuous at $x = 5$ (if the functtion can be made continuous)?

$$f(x) = \begin{cases} \frac{x^2 - 7x + 10}{x^2 - 5x} & : x < 5 \\ \frac{\sin(3x)}{5x} & : x > 5 \\ c & : x = 5 \end{cases}$$

4. Compute the derivative for the following definitions using the definition of the derivative (NO SHORTCUTS).

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

   (b) $f(x) = \frac{1}{x}$

   (c) $f(x) = \sqrt{x}$

   (d) $f(x) = \sin(x)$ Hint: use $\sin(a + b) = \sin(a)\cos(b) + \sin(b)\cos(a)$