MAT 161 Problem Session #5 Names:_____

1. Let $f(x) = e^x$. Find the average rate of change of f from $x = 1$ to $x = 1.1$. Why is this average rate of change greater than $f'(1)$?

2. Use the definition of the derivative at $x = a$, $f'(a) = \lim_{h \to 0} \frac{f(a+h) - f(a)}{h}$ to find $f'(3)$ for the following:

a) $f(x) = x^2 - 4x + 1$

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

c) $f(x) = \sqrt{x+4}$

3. The line $2x + 3y = 12$ is tangent to the graph of $y = f(x)$ at the point (3, 2). Find $f(3)$ and $f'(3)$.