Name: _____ Math 231 Quiz 4

1. (5 pts) Find the critical number(s) of the function

$$f(x) = x^3 - 3x^2 + 3x - 1.$$

2. (5 pts) Find $\frac{dy}{dx}$ in terms of x and y by implicit differentiation.

$$x \cdot \sin(y) = 1.$$

3. (5 pts) Find the linear approximation of the function $f(x) = \frac{1}{x}$ at $x = 1$, and use it to approximate the number $\frac{1}{1.01}$.

4. (5 pts) The area of a square is increasing at a rate of 100 cm^2/s. At what rate is each side of the square increasing when the area is 4 cm^2?