MTH 151
Quiz 2
Spring 2010

Show all work in a neat and organized fashion. Clearly indicate your answers.
20 points possible.

1. (8 pts.) The number N of locations of a popular coffeehouse chain is given in the table. (The numbers of locations as of June 30 are given.)

Year	1998	1999	2000	2001
N	1886	2135	3501	4709

(a) Find the average rate of growth from 1999 to 2001. Include the units.

(b) Find the average rate of growth from 1999 to 2000. Include the units.

(c) Find the average rate of growth from 1998 to 1999. Include the units.

(d) Estimate the instantaneous rate of growth in 1999 by taking the average of two average rates of change (use the most appropriate two). Include the units.

2. (6 pts.) On the attached page is the graph of a function f. (Assume the axes have equal scales.) Sketch the graph of f' below it.

3. (6 pts.) Find the derivative of the function f using the definition of derivative.

$$f(x) = \frac{4x}{2+5x}, \qquad f'(x) = \lim_{h\to 0} \frac{f(x+h) - f(x)}{h}$$

Show all important algebraic steps neatly to justify your answer. Hopefully you will find that $f'(x) = \dfrac{8}{(2+5x)^2}$. If your answer doesn't work out, don't fake it (because that would be an additional error); just do your best.