

NAME:

SECTION: (circle one) 11:00-11:55 12:05-1:00

Math 105 - Quiz 7 - November 2, 2005

Instructions: Show all of your work and circle your final answers. Calculators are allowed, but notes and books are not.

1. (5 pts. each) Evaluate the limits:

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

(b) $\lim_{t \rightarrow \infty} \frac{2t+3}{5-4t}$.

(c) $\lim_{x \rightarrow \infty} e^{-x} \ln x$.

2. (5 pts.) Consider the differential equation $\frac{dy}{dt} = y - t$. Plot a slope field for this DE with $0 \leq t \leq 2$ and $-1 \leq y \leq 1$. Give a rough sketch of the solution going through the point $(0, 0)$.

3. BONUS (3pts.) Newton's law of cooling says that, for an object cooling in a room, the rate at which the object cools is proportional to the difference between the temperature of the object and the environment temperature. Give a differential equation that models this behavior, explaining what all of the terms are.