Math 121 Quiz 10
Monday, November 21, 2011

You must SHOW ALL WORK and USE CORRECT NOTATION to receive credit. Your work must be organized, legible, and unambiguous. I will not try to interpret what you have written, guess what you really mean, or read what is illegible.

You must simplify all of your work unless you are explicitly instructed not to.

(5 points) Find the limit.

\[
\lim_{x \to +\infty} x^{1/x}
\]
(5 points) A function and its first two derivatives are given below.

a. Find the intervals on which \( f \) is increasing, decreasing, concave up, and concave down. Also, find the x-coordinates of all inflection points, if any.

b. Use either the First Derivative Test or Second Derivative Test to find the locations (i.e. x-coordinates) of all relative extrema, if any. Specify which test you are using.

\[
f(x) = e^{-x^2/2}, \quad f'(x) = -xe^{-x^2/2}, \quad f''(x) = (x^2 - 1)e^{-x^2/2}
\]