

NAME: \_\_\_\_\_

Panther ID: \_\_\_\_\_

Spring Break Worksheet – due Tuesday, March 22

- MAC 2311, Spring 2016

1. (5 pts) Use a local linear approximation to estimate (without calculator)  $7.9^{-1/3}$ . Be sure to write the function and the point you'll use for the local linear approximation.

2. (5 pts) (Adapted from a textbook by Tom Apostol) A bug is moving along the parabola  $y = x^2$ . (This means that the coordinates  $(x, y)$  of the bug are both functions of time  $t$ , and at every moment they satisfy the relation  $y = x^2$ .) At what point on the parabola are the  $x$ - and  $y$ -coordinates changing at the same rate with respect to time?

3. (5 pts each) Evaluate each of the following limits:

(a)  $\lim_{x \rightarrow 0} \left( \frac{1}{x} - \frac{1}{e^x - 1} \right)$

(b)  $\lim_{x \rightarrow +\infty} (e^x + x)^{1/x}$