

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

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

Spring Break Worksheet – due Thursday, March 23

- MAC 2311, Spring 2017

1. (5 pts) Use a local linear approximation to estimate (without calculator)  $\sqrt[100]{e}$ .  
Be sure to write the function and the point you are using for the local linear approximation.

2. (5 pts) (Similar to Pb. 25 section 3.4 in your book) A conical water tank with vertex down has a radius of 12 ft at the top and is 30 ft high. If water flows into the tank at the rate of  $20 \text{ ft}^3/\text{min}$ , how fast is the depth of the water increasing when the water is 10 ft deep?

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

(a)  $\lim_{x \rightarrow 0^+} x \ln x$

(b)  $\lim_{x \rightarrow +\infty} x^{(\ln a)/(1+\ln x)}$ , where  $a$  is a constant.