Name_____

MATH-110: Calculus I
Fall 2016
Siena College

Quiz 2

Please write your name on the top of each page. You will lose a point for each page you submit without your name.

For each question I would like you to show all the steps you took. An answer with no work will not be given any credit.

The goal of a test is not to answer the question, but it is to prove to me that you know the material that I am trying to assess you on. When you answer the questions you should break down each step so it is easy for me to follow. If you start doing work elsewhere on the page you may want to draw arrows so I can follow what you are doing.

I'd recommend looking at all the questions first so you can think about them while solving other problems.

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1. Find and classify the extreme points of $f_1(x)$. Then sketch it.
   Make sure to include zeros and asymptotes if any and label all identifiable points

$$f_1(x) = x(x-5)(-5-x)$$

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2. A manufacturer needs to make a cylindrical can that will hold 500 mL of liquid. Determine the dimensions of the can that will minimize the amount of material used in its construction.
   Recall that the volume of a cylinder is $V = \pi r^2 h$

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3. What is the 1st order (linear) approximation of $f_3(x) = \sin(\pi e^x)$ when $x = \frac{7}{10}$
   Bonus: Use Newton's method to find the next three approximations (x_1, x_2, x_3) of $f_3(x) = 0$ starting with $x_0 = \frac{7}{10}$