

Name_____

MATH-110: Calculus I

Fall 2016

Siena College

Test 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. When using rules we learned in class, state and show the rule used. If you can't remember the name of the rule then at the top of the page give it a name and write the definition next to the name you created. 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.

You are allowed to take 2 of the 6 problems home after the test to do at home. They are due by Friday, November 4th 2016. None of the bonuses count if they are not done in class.

Name _____

1. (17 points) Using the definition of the derivative calculate $f_1'(x)$

$$f_1(x) = x^2 + 4x + e^x$$

Name _____

2. (16 points) Using any method calculate $f_2'(x)$

Bonus: (3 points) Is $f_2(x)$ even, odd, both or neither? What about $f_2'(x)$? What, if anything, does the parity (even/odd-ness) of a function tell us about its derivative?

$$f_2(x) = 2x^7 + 3x^5 + 2x^3 + 7x + \frac{5}{8x} + \frac{1}{3x^3}$$

Name _____

3. (17 points) Using any method calculate $f_3'(x)$

$$f_3(x) = x \sin(e^{\sqrt{x}})$$

Name _____

4. (17 points) Using any method calculate $f'_4(x)$

$$f_4(x) = \frac{x^5 + 2x^3}{5x^4 + 6x^2}$$

Name _____

5. (17 points) Using implicit differentiation calculate $f'_5(x)$

$$f_5(x) = \log_{10}(x)$$

Name _____

6. (16 points) Using implicit differentiation calculate $f'_6(x)$

$$f_6(x) = \tan^{-1}(e^x)$$

Name _____

7. (3 points each) Bonus: Show and explain at least 4 different ways to solve $f_7'(x)$

$$f_7(x) = \ln(x^5)$$