

**Math 148 Quiz #4**  
**July 20, 2010**

Name: \_\_\_\_\_

Show all work and answers on a separate sheet with a box around your final answer. Calculators are permitted.

1. Find the derivative of each of the following functions. (You do **not** need to simplify.)

(a) (3 pts.)  $f(x) = e^{-x} \cdot \ln(3x)$

(b) (3 pts.)  $y = \frac{2x+7}{5x^4-x}$

2. Consider  $g(x) = -x^4 + 4x^3 + 7$  for parts (a)-(c) below.

(a) (6 pts.) Find the critical numbers and classify them as local maximums, local minimums, or neither using the first or second derivative tests.

(b) (4 pts.) Find the inflection **points**. (Be sure to show that  $g(x)$  switches concavity at these points.)

(c) (3 pts.) If the domain of  $g(x)$  is restricted to  $-1 \leq x \leq 3$ , find the global maximum and minimum **values**.

3. (1 pt.) Sketch a graph of a function with exactly one critical number/point, but with no local maximum or minimum.