Third Exam
Friday, October 30, 2015

This exam is closed book, but you may use calculators. Make sure your name is on all pages. Show all work, and show it in a logical and organized manner. Each entire problem is worth 25 points. Your work should be on your own paper, and you may keep this exam sheet.

1. Compute $f'(x)$ for the following functions.

   (a) $f(x) = x^2 + 3x + 2$; (b) $f(x) = e^{2x} + 2^x$; (c) $f(x) = \sqrt{5x^3}$;

   (d) $f(x) = \dfrac{1}{x^2}$; (e) $f(x) = x \ln(x)$.

2. Find all critical points of the function $f(x) = x^3 - 3x + 2$ and classify them as local maxima, local minima, or neither.

3. Find the global maximum and global minimum of the function in problem 2 over the interval $x \in [-1.1, 1.2]$.

4. The total cost of production, in thousands of dollars, is $C(q) = 20 + 2q + 0.05q^2$. For what value of q is the average cost minimized?