

Calculus: Homework 7

November 8th, 2007

1. Find intervals of increase/decrease and local extreme values of the following function

$$f(x) = \frac{x^2 - 2x + 1}{x + 1}.$$

2. Prove that for all $x > 0$,

$$(1 + x)^\alpha > 1 + \alpha x,$$

where $\alpha > 1$ is a real number.

3. Compute

$$\lim_{x \rightarrow 0^+} x^{\ln 2 / (1 + \ln x)}.$$

4. Use the guideline of Section 4.5 to sketch the graph of the function

$$f(x) = x\sqrt{9 - x^2}.$$

5. Show that the following equation

$$(1 - \ln x)^2 = x(3 - 2 \ln x)$$

has exactly two solutions.