

# Homework 6

Name:

Date: June 3, 2015

**P 1.** Find the extreme values of  $f(x) = (x^2 - 2x) \ln(x + 3)$  on the interval  $[0, 3]$

**P 2.** Let

$$f(x) = \begin{cases} \frac{1}{x+4} + \frac{3}{2} & x \leq -2 \\ 2|x+1| & -2 < x < 0 \\ e^{x-2} - 2 & 0 < x \leq 3 \\ -\frac{4 \tan^{-1}(7-x)}{\pi} & 3 < x \end{cases}$$

(a) Graph  $f(x)$ .

(b) Find the extrema of  $f(x)$  on  $[5, 9]$ .

(c) Find the extrema of  $f(x)$  on  $[2.5, 6]$ .

(d) Determine if the assumptions of the Extreme Value Theorem hold for  $f(x)$  on  $[-1, 1]$ , explain.

(e) Determine if the assumptions of the Mean Value Theorem hold for  $f(x)$  on  $[5, 9]$ , explain.

(f) Determine if the assumptions of Rolle's Theorem hold for  $f(x)$  on  $[-3, -1.5]$ , explain.