

MATH 1550 - Calculus I - Section 1
Summer 2013

HOMEWORK 5

Due at the beginning of class, Friday, July 12th

Read the questions carefully. You must *show your work* to get full credit.

- (1) The cross-section of a 7-mile bike path is modeled by the graph of the function $f(x) = \frac{3}{50}(\frac{1}{4}x^4 - 3x^3 + \frac{15}{2}x^2 + 9x - 10)$ over the interval $[0, 7]$. For safety reasons, the slope of the course can never be greater than 1 or less than -1 . Show that this path satisfies these safety regulations.
- (2) Find and classify the critical points of $f(x) = \ln(x^3 - 5x^2 + 3x - 6)$
- (3) Find any points of inflection on the graph of $f(x) = 3x^5 - 10x^4 - 80x^3 + 17x$
- (4) Evaluate $\lim_{x \rightarrow 0} \frac{x^3}{\tan x}$
- (5) Evaluate $\lim_{x \rightarrow 0} \frac{x \sin x}{e^{2x} - 2x - 1}$