MA1125 – Calculus
Homework #6
due Thursday, Nov. 1

1. Find the global minimum and the global maximum values that are attained by

$$f(x) = x^3 - 6x^2 + 9x - 5, \qquad 0 \leq x \leq 2.$$

2. If a right triangle has a hypotenuse of length $a > 0$, how large can its area be?

3. A balloon is rising vertically at the rate of 1 m/sec. When it reaches 48m above the ground, a bicycle passes under it moving at 3 m/sec along a flat, straight road. How fast is the distance between the bicycle and the balloon increasing 16 seconds later?

4. Find the linear approximation to the function f at the point x_0 in the case that

$$f(x) = \frac{x^3 - 2x + 4}{x^2 + 2}, \qquad x_0 = 0.$$

5. Show that $f(x) = x^3 - 4x + 1$ has two roots in $(0, 2)$ and use Newton's method with initial guesses $x_1 = 0, 2$ to approximate these roots within two decimal places.

- This assignment is due by Thursday noon, either in class or else in my office.
- Write your name and course (Maths, TP, TSM) on the first page of your homework.
- NO LATE HOMEWORK WILL BE ACCEPTED.