

Aero 320: Numerical Methods

Lab Assignment 16

Fall 2013

Problem 1

Numerical differentiation

For small $h > 0$, use Taylor series expansion to show that

(a)

$$f'(x_0) = \frac{f(x_0 + h) - f(x_0)}{h} + O(h),$$

(b)

$$f''(x_0) = \frac{f(x_0 - h) - 2f(x_0) + f(x_0 + h)}{h^2} + O(h^2).$$