EML3041 Computational Methods: Week One: Session 02

Answer each free-response question on a fresh sheet of paper. Solve the problem as if you were submitting them for a test. Submit at the end of the class.

1) What does the pre-specified percentage tolerance need to be less than or equal to get at least 4 significant digits correct in an iterative scheme?

2) A Maclaurin series for a function is given by

$$f(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} + \dots \dots$$

How many terms should be used in the series to consider at least 2 significant digits are correct in your answer f(0.1)?

Answer: 2

3) What is the truncation error in the calculation of the f'(4) that uses the approximation

$$f'(x) \approx \frac{f(x+h) - f(x)}{h}$$

for
$$f(x) = 9x^3$$
, $h = 0.5$

Answer: = -56.25