BMTH311: Assignment #1

Required Reading.

- Read §1.6.1, 1.6.3, 2.1, 2.2

To be turned in December 12th, at the start of class.

1. Problem 2.4.2, page 49

2. Problem 2.4.3, page 49

3. Problem 2.4.7 ai, aii, pg 51

4. Problem 2.4.7 bi, bii, pg 51

5. Problem 2.4.9, pg 52

6. Use Matlab's numerical ODE solver *ode45* to find a numerical solution to the following problem:

$$x'' + x = t, \quad x'(0) = 0, \quad x(0) = 0$$

Call this numerical solution $x_n(t)$. Compare to the exact solution

$$x_e(t) = t - \sin(t)$$

by plotting the error $|x_n - x_e|$ on the interval $t \in [0, 10]$. You may find it helpful to examine Appendix C.2 in your textbook. You may also find it interesting to reset Matlab's default options for *ode45* to try to obtain more or less accuracy, but this is not required.