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# MATH 448/548 - Numerical Analysis

## Homework assignment 1

*Date assigned:* September 10, 2009

*Due date:* **September 22, 2009**

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- Include a cover page and *this* problem sheet
- Include the printout of your program(s) for completeness

### PROBLEMS:

1. Use Bisection method to find solution accurate to within  $10^{-5}$  for the following problems:

$$x^2 + 2x - 3 = 0, \text{ for } -2 \leq x \leq 2,$$

$$x - 2^{-x} = 0, \text{ for } 0 \leq x \leq 1.$$

Show the number of iterations, the value of approximate solution and approximation error for each iteration.

2. Use a fixed-point iteration to find a solution to within  $10^{-2}$  for

$$x^3 - x - 1 = 0 \text{ on } [1, 2].$$

Use  $p_0 = 1$ .

Use two different representations  $g(x) = x$ . For each case show the number of iterations and the value of approximate solution for each iteration. Compute the convergence factor  $k$  in both cases.