

Homework Set 1: Due this Friday

1. Show that the equation $1 + 2x + x^3 + 4x^5 = 0$ has *exactly* one real solution.
2. (Section 1.1, Exercise 6) Suppose that the Bisection method is applied to $f(x) = 1/x$ with a starting interval $[-2, 1]$. Does the method converge to a real number? Explain.
3. (Computer Problem 7, page 31) Use the Bisection method to find the two real numbers x , within 6 correct decimal places, that make the determinant of

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 4 & 5 & x & 6 \\ 7 & x & 8 & 9 \\ x & 10 & 11 & 12 \end{bmatrix}$$

equal to 1000. For each solution you find, test it by computing the corresponding determinant and report how many correct decimal places the determinant has when x is used. You should use the Matlab command `det`.

Hint: Translate the problem into something that you can use the IVT (and therefore Bisection) on.

4. Computer Problem 5, pg 45.