# Numerical Analysis

Math 370 MWF 2:30-3:25
Spring 1997 127 Fowler

**(01.29.97)** Root Finding: Bisection Method and False Position

We are (finally) going to start looking at numerical methods of solution of problems! The first set of problems we will look at is algorithms for the solution of equations of one variable, i.e. equations of the form $f(x) = 0$. This is often referred to as finding the **roots** of the equation $f(x) = 0$ or finding the **zeroes** of the function $f(x)$.

**Bracketing The Root**

**Bisection Algorithm**

**Error Formula**

**Example**

Use the `TruBasic` program `ALG21.TRU` to find the root of the equation below:

How many iterations does it take to converge? Using what criteria? What if it changes?

What are some good features of the bisection algorithm?

What are some drawbacks to the bisection algorithm?

**False Position Method (Regula Falsi)**

The method of False Position is another ancient method of computing the solution of equations of one variable. It is very similar to the bisection method in that it too is a bracketing method, except that False Position uses the **value** of the function at the end points to help determine where the next bracket occurs. Sketch a picture of this process, below:
**False Position visually**

**False Position Algorithm**

**Example**
Use False Position to solve the same equation you previously solved using Bisection and see if there is a difference in the number of steps

NOTE: Wed and Fri Classes Will Be In Fowler 127