

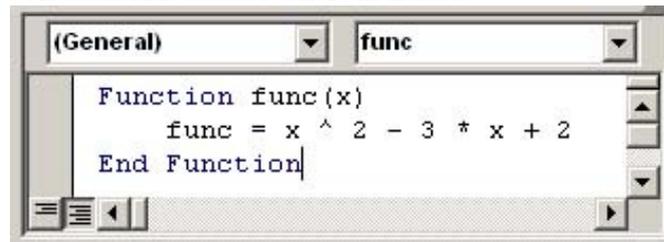
LECTURE 1. SOLVING EQUATIONS

30 September 2008, Sackville/C53

Teaching materials are at

<http://personalpages.manchester.ac.uk/staff/henry.tan/teaching/computation2/computation2.htm>**I. Function graphing**

The type of graph you will want most often is the independent variable X plotted against the dependent variable Y. This is called an XY Scatter Chart in Excel.

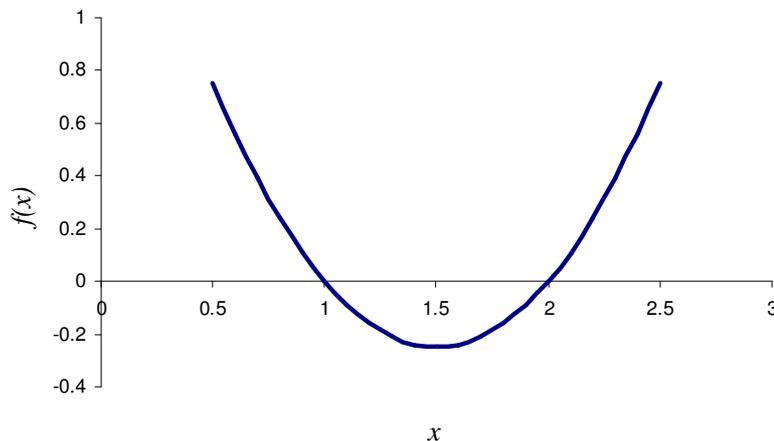


```

Function func(x)
    func = x ^ 2 - 3 * x + 2
End Function

```

$$f(x) = x^2 - 3x + 2$$

**II. Bisection method**To locate a root of $f(x)$:

1. Locate two x -values, a & b so that $f(a) > 0$ and $f(b) < 0$ or vice versa.
2. Bisect the interval $[a, b]$:

$$c = \frac{a+b}{2}$$

3. Replace either a or b with c in order that the new interval $[a, b]$ still contains the root. Note: The sign of $f(a)$ and the sign of $f(b)$ (positive or negative) never change.

III. Goal Seek and Solver

Microsoft Excel can be used to solve mathematical equations and optimization problems (i.e. where a value is calculated from more than one independent cell). Simple problems can be solved using Goal Seek.

A more powerful version of Goal Seek is provided by Solver. Whereas Goal Seek has a single target cell and changing cell, Solver can work out solutions to problems involving several changing cells (i.e. cells storing or calculating independent values). In it, you can also set up constraint criteria (e.g. that cells must hold positive values or be whole numbers).