

Rearrangement Method

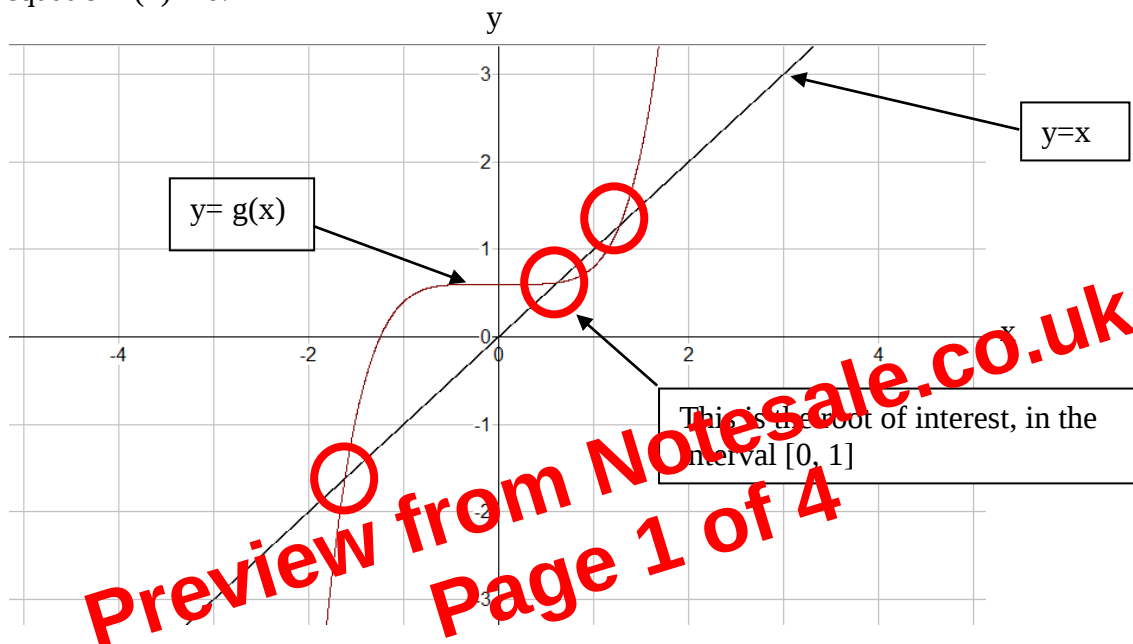
Method and Example

This method will find an **interval** in which the root lies.

The first intention is to find a root of the equation: $f(x) = x^5 - 5x + 3 = 0$

This can be rearranged into the form $x = g(x)$, where $g(x) = \frac{x^5 + 3}{5}$

When put on a graph with $y = x$, the two graphs should intersect. Below are the roots of the equation $f(x) = 0$.



This gives the iterative formula: $x_{n+1} = \frac{x_n^5 + 3}{5}$. When $x_0 = 0$, the iterative formula produces the following values:

x_0	0
x_1	0.6
x_2	0.61555
x_3	0.61767
x_4	0.61798
x_5	0.61803

The function $g(x)$ converges on the graph $y = x$ at 0.61803, this is a root of the equation $x^5 - 5x + 3 = 0$.