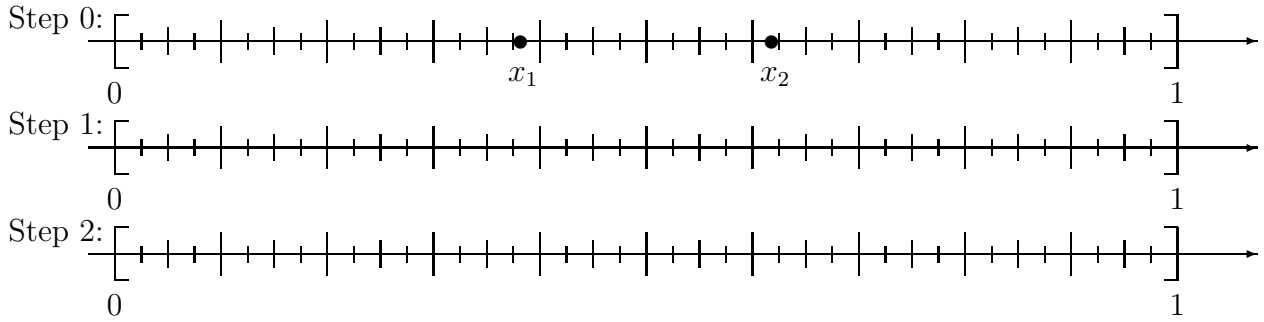
Quiz (4) MCS 471 Jan Verschelde Friday 16 September 2005

NAME : Type of Calculator :

1. Consider $f(x) = x^2 - 0.4x + 1.03$. Apply 2 steps of the golden section search method to find the minimum of f in $[0, 1]$. Complete the table below, calculating with 4 decimal places using rounding in scientific notation:

step	x_1	x_2	$f(x_1)$	$f(x_2)$
0	3.820E–1	6.180E–1		
1				
2				

Mark **all** values for x_1 and x_2 on the axes:



2. Newton's method applied to a polynomial with a multiple root produces a sequence of updates `dx` for the root. Using the values for `abs(dx)` below as estimates for consecutive errors, show how you can calculate the multiplicity of the root.

```
 abs(dx)
7.91e-03
5.93e-03
4.45e-03
3.34e-03
2.50e-03
1.88e-03
1.41e-03
1.06e-03
7.92e-04
5.94e-04
4.45e-04
3.34e-04
```