Homework 4

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Problem 1: Website

Website Link = Click Here.

Problem 2: Newton Root Finder

1. In this exercise, I have modified a couple of bits in file '`RootFinder.F90`'. I added a '`ftnType`' to line 34 so the driver file knows which function is being used. This then allows us to print the target function. I added the printing commands between lines 67-79 in '`RootFinder.F90`'.

2. I have added the print commands between lines 57 and 67 in file `setup_module.F90`.

3. For this exercise, we had to plot the target function, roots and the initial guess. It is shown in figure 1.

4. Since all variables are allocated when the code is compiled and the value set when the 'rootFinder.init' is read then there is no need to recompile the code. This is why they are called runtime parameters.

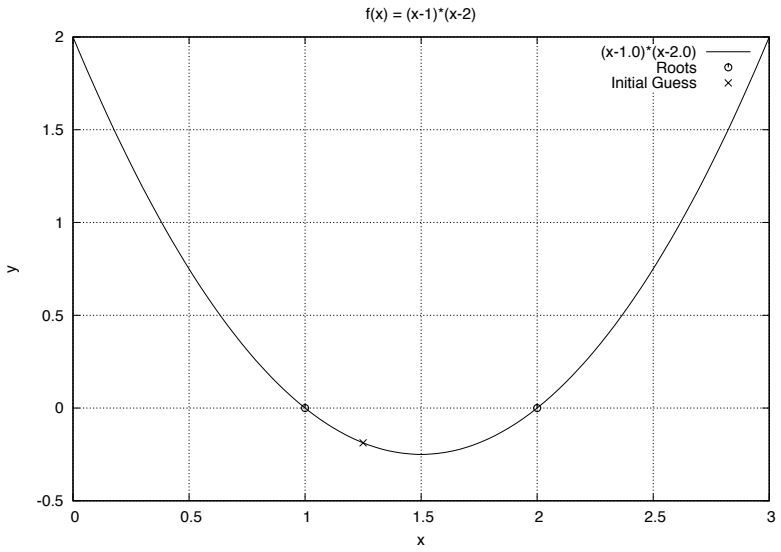
5.

6.

7.

8. The make debug runs '`FFLAGS_OPT = $(FFLAGS_DEBUG)`' this command which makes the gfortran flags the debugging flags. Therefore rather

Figure 1: The target function $f(x) = (x-1)(x-2)$.



than compiling with the optimization flags, it will compile with debugging flags.

Problem 3: π Approximation

For this problem we had to program a modularized version of the π approximation from homework 2. In Figure 2 we show the approximation versus the number of summations.

Figure 2: The approximation of π at each summation.