ASSIGNMENT 7 - Solution

Due April 1, 2004 (before start of class)

Problem 7: Computer Problem 5.19 on p.252 of Heath - Solution

We use the program NewtonD04.m to find the roots using the typical model parameters of $\gamma = 5$ and $\delta = 1$.

First in order to obtain intermediate results for **x**, we need to put back a statement within the loop to display the current results.

This function is called for example by the following statement:

```
x = NewtonD04('fcnCP5p19','fcnJCP5p19',[1;2],tol,maxIt,gamma,delta),
```

It turns out that there are a total of 3 roots. We need to experiment with different starting points in order to obtain all three roots. For a starting value of $[1; 2]$ we obtain the result:

```
  1.00000000000000    0.44444444444444   1.22222222222222   0.95581391856029
  2.00000000000000    0.09688162276718   1.01029367241901   0.40707938443742
  3.00000000000000    0.00132590955302   0.99988839002829   0.09612057131279
  4.00000000000000   -0.00000019739698   1.00000003090647   0.00133079800441
  5.00000000000000   -0.00000000000001   1.00000000000000   0.00000019980184

Newton method has converged.
x =
  -0.00000000000001
   1.00000000000000
```

For a starting value of $[1; 2]$ we obtain the result:

```
  1.00000000000000    0.34285714285714  -1.22857142857143   1.01337987719818
  2.00000000000000    0.04923319690320  -1.01625326692638   0.36234517162769
  3.00000000000000    0.00062990232335  -1.00005249336382   0.05123226823049
  4.00000000000000    0.00000002645241  -0.99999999807133   0.00063205962418
  5.00000000000000   -0.00000000000000  -1.00000000000000   0.00000002652263
Newton method has converged.
```

```
x =

  -0.00000000000000
  -1.00000000000000
```

Finally, for a starting value of $[1; 2]$ we obtain the result:

```
  1.00000000000000   4.00000000000000   0.50000000000000   2.06155281280883
  2.00000000000000   4.00000000000000   0.25000000000000   0.25000000000000
  3.00000000000000   3.75000000000000   0.25000000000000   0.25000000000000
  4.00000000000000   3.75000000000000   0.25000000000000                  0
Newton method has converged.
x =

  3.75000000000000
  0.25000000000000
```