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CS 3010.01

Programming Project 2

13 April 2019

The data type for all the numbers used and calculated are doubles. The starting points used for function 1 are incremented by one; some starting points resulted in the same root, so I chose the method that took more iterations to graph. The tables underneath each graph lists the starting points that were used for finding each root. According to the graphs, the false position method for the roots of both functions converges the fastest, while the bisection method converges the slowest.

FUNCTION #1: f(x) = 2x3 - 11.7x2 + 17.7x - 5

| n   | a  | l b               | c                 | f(a)              | f(b)              | f(c)   | Error |
|---|--|-------------------|-------------------|-------------------|-------------------|--------|-------|
| 0   | 0.000  | 1.000             | 0.500             | -5.000            | 3.000             | 1.175  | 1.000 |
| 1   | 0.000  | 0.500             | 0.250             | -5.000            | 1.175             | -1.275 | 1.000 |
| 2   | 0.250  | 0.500             | 0.375             | -1.275            | 1.175             | 0.098  | 0.333 |
| 3   | 0.250  | 0.375             | 0.313             | -1.275            | 0.098             | -0.550 | 0.200 |
| 4   | 0.313  | 0.375             | 0.344             | -0.550            | 0.098             | -0.217 | 0.091 |
| 5   | 0.344  | 0.375             | 0.359             | -0.217            | 0.098             | -0.057 | 0.043 |
| 6   | 0.359  | 0.375             | 0.367             | -0.057            | 0.098             | 0.021  | 0.021 |
| 7   | 0.359  | 0.367             | 0.363             | -0.057            | 0.021             | -0.018 | 0.011 |
| 8   | 0.363  | 0.367             | 0.365             | -0.018            | 0.021             | 0.001  | 0.005 |
| BISECTIO  | N - The root 0.30  | 55 has been found | d in between 0 ar | nd 1 for function | n #1 in 8 iterati | ions.  |       |
| n   | a  | Ь                 | c                 | f(a)              | f(b)              | f(c)   | Error |
| 0   | 1.000  | 2.000             | 1.500             | 3.000             | -0.400            | 1.975  | 1.000 |
| 1   | 1.500  | 2.000             | 1.750             | 1.975             | -0.400            | 0.863  | 0.143 |
| 2   | 1.750  | 2.000             | 1.875             | 0.863             | -0.400            | 0.238  | 0.067 |
| 3   | 1.875  | 2.000             | 1.938             | 0.238             | -0.400            | -0.081 | 0.032 |
| 4   | 1.875  | 1.938             | 1.906             | 0.238             | -0.081            | 0.079  | 0.016 |
| 5   | 1.906  | 1.938             | 1.922             | 0.079             | -0.081            | -0.001 | 0.008 |
| BISECTION - The root 1.922 has been found in between 1 and 2 for function #1 in 5 iterations. |  |                   |                   |                   |                   |        |       |
| n   | a  | b                 | c                 | f(a)              | f(b)              | f(c)   | Error |
| 0   | 2.000  | 3.000             | 2.500             | -0.400            | -3.200            | -2.625 | 1.000 |
| 1   | 2.500  | 3.000             | 2.750             | -2.625            | -3.200            | -3.212 | 0.091 |
| 2   | 2.750  | 3.000             | 2.875             | -3.212            | -3.200            | -3.293 | 0.043 |
| 3   | 2.875  | 3.000             | 2.938             | -3.293            | -3.200            | -3.270 | 0.021 |
| 4   | 2.938  | 3.000             | 2.969             | -3.270            | -3.200            | -3.241 | 0.011 |
| 5   | 2.969  | 3.000             | 2.984             | -3.241            | -3.200            | -3.222 | 0.005 |
| BISECTIO  | BISECTION - There are no roots in between 2 and 3 for function #1. |                   |                   |                   |                   |        |       |
| n   | a  | b                 | c                 | f(a)              | f(b)              | f(c)   | Error |
| 0   | 3.000  | 4.000             | 3.500             | -3.200            | 6.600             | -0.625 | 1.000 |
| 1   | 3.500  | 4.000             | 3.750             | -0.625            | 6.600             | 2.313  | 0.067 |
| 2   | 3.500  | 3.750             | 3.625             | -0.625            | 2.313             | 0.687  | 0.034 |
| 3   | 3.500  | 3.625             | 3.563             | -0.625            | 0.687             | -0.007 | 0.018 |
| 4   | 3.563  | 3.625             | 3.594             | -0.007            | 0.687             | 0.330  | 0.009 |
| BISECTION - The root 3.594 has been found in between 3 and 4 for function #1 in 4 iterations. |  |                   |                   |                   |                   |        |       |

|  | l vn  | f(vn)   | l f!(vn)  | Error   |  |   |
|--|---|---|---|---|--|---|
| n  | xn<br>  | f(xn)   | f'(xn)  |   |  |   |
| 0  | 1.000   | 3.000   | 0.300   | 1.000   |  |   |
| 1  | -9.000  | -2570.000   | 714.300   | 1.111   |  |   |
| 2  | -5.402  | -757.341  | 319.203   | 0.666   |  |   |
| 3  | -3.029  | -221.608  | 143.656   | 0.783   |  |   |
| 4  | -1.487  | -63.756   | 65.756  | 1.038   |  |   |
| 5  | -0.517  | -17.563   | 31.409  | 1.874   |  |   |
| 6  | 0.042   | -4.279  | 16.730  | 13.345  |  |   |
| 7  | 0.298   | -0.715  | 11.267  | 0.859   |  |   |
| 8  | 0.361   | -0.039  | 10.032  | 0.176   |  |   |
| 9  | 0.365   | -0.000  | 9.957   | 0.011   |  |   |
|  | :   | :   | 9.956   |   |  |   |
| 10   | 0.365   | -0.000  | •   | 0.000   | in 10 itematicas   |   |
| NEWTON -   | The root 0.363  | nas been tound  | ron tunction #1 s   | starting at x = 1   | in 10 iterations   | •   |
| n  | l xn  | f(xn)   | f'(xn)  | Error   |  |   |
|  |   | 1 '(X)  | 1 ' (***)   |   |  |   |
| 0  | 2.000   | -0.400  | -5.100  | 1.000   |  |   |
| 1  | :   |   |   | :   |  |   |
|  | 1.922   | 0.001   | -5.110  | 0.041   |  |   |
| 2  | 1.922   | -0.000  | -5.110  | 0.000   |  |   |
| NEWTON -   | The root 1.922  | has been tound  | for function #1 9   | starting at x = 2   | in 2 iterations.   |   |
|  |   |   |   |   |  |   |
| n  | xn  | f(xn)   | f'(xn)  | Error   |  |   |
|  |   |   |   |   |  |   |
| 0  | 3.000   | -3.200  | 1.500   | 1.000   |  |   |
| 1  | 5.133   | 48.090  | 55.687  | 0.416   |  |   |
| 2  | 4.270   | 12.956  | 27.172  | 0.202   |  |   |
| 3  | 3.793   | 2.948   | 15.263  | 0.126   |  |   |
| 4  | 3.600   | 0.398   | 11.216  | 0.054   |  |   |
| 5  | 3.564   | 0.012   | 10.522  | 0.010   |  |   |
|  | •   | •   | •   | •   | in 5 iterations.   |   |
|  | 1110 1 000 31304  | nas seen rouna  | TOT TURNECTOR WIT   | star ting at x  | 111 5 1001 00101151  |   |
| n  | xn  | f(xn)   | f'(xn)  | Error   |  |   |
| "  | , AII   | '(XII)  | 1 (AII)   | LITOI   |  |   |
| 0  | 1 4 000   | 1 6 600   | 1 20 100  | 1 1 000   |  |   |
| 0  | 4.000   | 6.600   | 20.100  | 1.000   |  |   |
| 1  | 3.672   | 1.255   | 12.669  | 0.089   |  |   |
| 2  | 3.573   | 0.099   | 10.681  | 0.028   |  |   |
| 3  | 3.563   | 0.001   | 10.500  | 0.003   |  |   |
| NEWTON -   | The root 3.563  | has been found  | for function #1 s   | starting at $x = 4$   | in 3 iterations.   |   |
|  |   |   | 1   | 1   |  | _   |
| n  | xn-1  | xn  | f(xn-1)   | f(xn)   | f'(xn)   | Error   |
|  |   |   |   |   |  |   |
| 0  | 0.000   | 1.000   | -5.000  | 3.000   | 0.300  | 1.000   |
| 1  | 1.000   | 0.625   | 3.000   | 1.980   | 5.419  | 0.600   |
| 2  | 0.625   | -0.103  | 1.980   | -6.958  | 20.185   | 7.042   |
| 3  | -0.103  | 0.464   | -6.958  | 0.890   | 8.141  | 1.223   |
| 4  | 0.464   | 0.399   | 0.890   | 0.329   | 9.313  | 0.161   |
| 5  | 0.399   | 0.362   | 0.329   | -0.036  | 1 10 024   |   |
| 6  |   |   |   |   | 10.024   |   |
|  | 1 0.362   | 0.365   | -0.036  |   | 10.024  <br>  9.954  | 0.104   |
| /  | 0.362<br>0.365  | 0.365<br>0.365  | -0.036<br>0.001   | 0.001   | 9.954  | 0.104<br>0.010  |
| 7<br>SECANT -  | 0.365   | 0.365   | 0.001   | 0.001   | 9.954   9.956  | 0.104   |
|  | 0.365   | 0.365   | 0.001   | 0.001   | 9.954  | 0.104<br>0.010  |
| SECANT -   | 0.365<br>The root 0.365   | 0.365<br>has been found   | 0.001<br>for function #1 s  | 0.001<br>  0.000<br>starting at x = 1   | 9.954  <br>9.956  <br>in 7 iterations.   | 0.104<br>0.010<br>0.000   |
|  | 0.365   | 0.365   | 0.001   | 0.001   | 9.954   9.956  | 0.104<br>0.010  |
| SECANT -   | 0.365<br>The root 0.365<br>xn-1   | 0.365 has been found  | 0.001<br>for function #1 9<br>  f(xn-1)   | 0.001<br>  0.000<br>starting at x = 1<br>  f(xn)  | 9.954  <br>  9.956  <br>  in 7 iterations.<br>  f'(xn)   | 0.104<br>0.010<br>0.000<br>Error  |
| SECANT -   | 0.365<br>The root 0.365<br>xn-1   | 0.365 has been found   xn   2.000   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000  | 0.001<br>  0.000<br>starting at x = 1<br>  f(xn)<br>  -0.400  | 9.954  <br>  9.956  <br>  in 7 iterations.<br>  f'(xn)  <br>  -5.100   | 0.104<br>0.010<br>0.000<br>Error<br>0.500   |
| n 0 1  | 0.365 The root 0.365    xn-1   1.000   2.000  | 0.365<br>has been found   xn<br>  2.000<br>  1.882  | 0.001<br>for function #1 s<br>  f(xn-1)<br><br>  3.000<br>  -0.400  | 0.001<br>  0.000<br>starting at x = 1<br>  f(xn)<br>  -0.400<br>  0.201   | 9.954  <br>  9.956  <br>  in 7 iterations.<br>  f'(xn)  <br>  -5.100  <br>  -5.088   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062  |
| n  | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882  | 0.365<br>has been found   xn<br>  2.000<br>  1.882<br>  1.922   | 0.001<br>for function #1 s<br>  f(xn-1)<br><br>  3.000<br>  -0.400<br>  0.201   | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000  | 9.954  <br>  9.956  <br>in 7 iterations.<br>  f'(xn)  <br>  -5.100  <br>  -5.088  <br>  -5.110   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020   |
| n 0 1 2 3  | 0.365 The root 0.365    xn-1   1.000   2.000   1.882   1.922  | 0.365<br>has been found   xn<br>  2.000<br>  1.882<br>  1.922<br>  1.922  | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000  | 9.954  <br>  9.956  <br>in 7 iterations.<br>  f'(xn)  <br>  -5.100  <br>  -5.088  <br>  -5.110  <br>  -5.110   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062  |
| n 0 1 2 3  | 0.365 The root 0.365    xn-1   1.000   2.000   1.882   1.922  | 0.365<br>has been found   xn<br>  2.000<br>  1.882<br>  1.922<br>  1.922  | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000  | 9.954  <br>  9.956  <br>in 7 iterations.<br>  f'(xn)  <br>  -5.100  <br>  -5.088  <br>  -5.110   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020   |
| n 0 1 2 3 SECANT -   | 0.365 The root 0.365    xn-1  | 0.365<br>has been found   xn<br>  2.000<br>  1.882<br>  1.922<br>  1.922<br>has been found  | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>starting at x = 1<br>  f(xn)<br>  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   -5.110   in 3 iterations.   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000  |
| n 0 1 2 3  | 0.365 The root 0.365    xn-1   1.000   2.000   1.882   1.922  | 0.365<br>has been found   xn<br>  2.000<br>  1.882<br>  1.922<br>  1.922  | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000  | 9.954  <br>  9.956  <br>in 7 iterations.<br>  f'(xn)  <br>  -5.100  <br>  -5.088  <br>  -5.110  <br>  -5.110   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020   |
| n 0 1 2 3 SECANT -   | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922   | 0.365 has been found   xn   2.000   1.882   1.922   1.922 has been found   xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 s   | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2   | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   -5.110   in 3 iterations.   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000  |
| n 0 1 2 3 SECANT -   | 0.365 The root 0.365    xn-1  | 0.365 has been found   xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 s<br>  f(xn-1)  | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   -5.110   in 3 iterations.   f'(xn)   -5.000   1.500   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000  |
| n 0 1 2 3 SECANT -   | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922   | 0.365 has been found   xn   | 0.001<br>for function #1 9<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 9<br>  f(xn-1)<br>  -0.400<br>  -3.200  | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329   | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   -5.110   in 3 iterations.   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000  |
| n 0 1 2 3 SECANT -   | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1   | 0.365 has been found   xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 s<br>  f(xn-1)  | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   -5.110   in 3 iterations.   f'(xn)   -5.000   1.500   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error   |
| n 0 1 2 3 SECANT -   | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1   | 0.365 has been found   xn   | 0.001<br>for function #1 9<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 9<br>  f(xn-1)<br>  -0.400<br>  -3.200  | 0.001<br>  0.000<br>  0.000<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329   | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   -5.110   in 3 iterations.   f'(xn)   1.500   -5.063   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error   |
| 9 1 2 3 SECANT - n n 0 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1   | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1<br>  2.000<br>  3.000<br>  1.857  | 0.365 has been found     xn   2.000   1.882   1.922   1.922 has been found     xn   3.000   1.857   1.964   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 s<br>  f(xn-1)<br>  -0.400<br>  -3.200<br>  0.329   | 0.001<br>  0.000<br>  0.000<br>  1.000<br>  0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   1.500   -5.063   -5.114   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054  |
| n 0 1 2 3 SECANT - n 0 1 1 2 2 3 4 4   | 0.365<br>The root 0.365<br>  xn-1<br>   | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  starting at x = 1<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   1.500   -5.063   -5.114   -5.110  | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022   |
| n 0 1 2 3 SECANT - n 0 1 1 2 2 3 4 4   | 0.365<br>The root 0.365<br>  xn-1<br>   | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  starting at x = 1<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   -5.063   -5.063   -5.114   -5.110   - | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022   |
| N  | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1<br>  2.000<br>  3.000<br>  1.857<br>  1.964<br>  1.922<br>The root 1.922  | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 s<br>  f(xn-1)<br>  -0.400<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>for function #1 s                                     | 0.001<br>  0.000<br>  0.000<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000<br>  starting at x = 3   | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   -5.063   -5.063   -5.114   -5.110   -5.110   in 4 iterations.   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022<br>0.000  |
| n 0 1 2 3 SECANT - n 0 1 1 2 2 3 4 4   | 0.365<br>The root 0.365<br>  xn-1<br>   | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  starting at x = 1<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   -5.063   -5.063   -5.114   -5.110   - | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022   |
| 0 1 2 3 SECANT - n 0 1 2 3 4 SECANT - n 1 2 3 4 SECANT - n 1 1 2 3 4 SECANT - n 1 1 2 1 3 4 5 SECANT - n 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1<br>  2.000<br>  3.000<br>  1.857<br>  1.964<br>  1.922<br>The root 1.922<br>  xn-1  | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 s<br>  f(xn-1)<br>  -0.400<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>for function #1 s                                     | 0.001<br>  0.000<br>  0.000<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000<br>  starting at x = 3   | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   1.500   -5.063   -5.114   -5.110   -5.110   in 4 iterations.   f'(xn)   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022<br>0.000<br>Error                                     |
| SECANT -  n 0 1 2 3 SECANT -  n 0 1 2 3 4 SECANT -  n 0  | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1<br>  2.000<br>  3.000<br>  1.857<br>  1.964<br>  1.922<br>The root 1.922<br>  xn-1<br>  3.000   | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 s<br>  f(xn-1)<br>  -0.400<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>for function #1 s                                     | 0.001<br>  0.000<br>  0.000<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000<br>  starting at x = 3<br>  f(xn)  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   1.500   -5.063   -5.114   -5.110   -5.110   in 4 iterations.   f'(xn)   1.500   -5.063   -5.114   -5.110   -5.110   -5.110   1.500   -5.010   1.500   -5.010   1.500   -5.010   1.500   -5.010   -5.010   1.500   -5.010   -5.010   1.500   -5.010   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022<br>0.000<br>Error                                     |
| PECANT -  n 0 1 2 3 SECANT -  n 0 1 2 3 4 SECANT -  n 0 1  | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1<br>  2.000<br>  3.000<br>  1.857<br>  1.964<br>  1.922<br>The root 1.922<br>  xn-1  | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.201<br>  0.000<br>for function #1 s<br>  f(xn-1)<br>  -0.400<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>for function #1 s<br>  f(xn-1)<br>  -3.200<br>  6.600 | 0.001<br>  0.000<br>  0.000<br>  1.000<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  -0.000<br>  -0.201<br>  0.000<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000<br>  starting at x = 3<br>  f(xn)  | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   -5.063   -5.063   -5.114   -5.110   in 4 iterations.   f'(xn)   in 4 iterations.   f'(xn)   -5.063   -5.114   -5.110   -5.110   -5.110   in 4 iterations.   f'(xn)   -5.0100   6.254   -5.254   | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022<br>0.000<br>Error                                     |
| SECANT -  n 0 1 2 3 SECANT -  n 0 1 2 3 4 SECANT -  n 0 1 2 3 4 SECANT -   | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1<br>  2.000<br>  3.000<br>  1.857<br>  1.964<br>  1.922<br>The root 1.922<br>  xn-1<br>  3.000<br>  4.000<br>  3.327                                 | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  1.000<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000<br>  starting at x = 3<br>  f(xn)   | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   1.500   -5.063   -5.114   -5.110   in 4 iterations.   f'(xn)   1.510   in 4 iterations.   f'(xn)   1.510  | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022<br>0.000<br>Error                                     |
| PECANT -  n 0 1 2 3 SECANT -  n 0 1 2 3 4 SECANT -  n 0 1 2 3 4 SECANT -  n  | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1<br>  2.000<br>  3.000<br>  1.857<br>  1.964<br>  1.922<br>The root 1.922<br>  xn-1<br>  3.000<br>  4.000<br>  3.327<br>  3.481                      | 0.365 has been found   xn   2.000   1.882   1.922   1.922 has been found   xn   3.000   1.857   1.964   1.922   1.922 has been found   xn   4.000   3.327   3.481   3.586 | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  starting at x = 1<br>  f(xn)<br>  -0.400<br>  0.201<br>  0.000<br>  -0.000<br>  starting at x = 2<br>  f(xn)<br>  -3.200<br>  0.329<br>  -0.214<br>  0.001<br>  0.000<br>  starting at x = 3<br>  f(xn)<br>  -6.600<br>  -1.969<br>  -0.796<br>  0.248   | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   -5.063   -5.114   -5.110   -5.110   in 4 iterations.   f'(xn)   -5.110    | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022<br>0.000<br>Error<br>0.250<br>0.202<br>0.044<br>0.029 |
| SECANT -  n 0 1 2 3 SECANT -  n 0 1 2 3 4 SECANT -  n 0 1 2 3 4 SECANT -   | 0.365<br>The root 0.365<br>  xn-1<br>  1.000<br>  2.000<br>  1.882<br>  1.922<br>The root 1.922<br>  xn-1<br>  2.000<br>  3.000<br>  1.857<br>  1.964<br>  1.922<br>The root 1.922<br>  xn-1<br>  xn-1<br>  3.000<br>  4.000<br>  3.327<br>  3.481<br>  3.586 | 0.365 has been found     xn   | 0.001<br>for function #1 s<br>  f(xn-1)<br>   | 0.001<br>  0.000<br>  0.000<br>  1.000<br>  0.201<br>  0.000<br>  0.000<br>  0.000<br>  0.000<br>  0.329<br>  0.329<br>  0.214<br>  0.001<br>  0.000<br>  0.000<br>  0.001<br>  0.000<br>  0.000<br>  0.001<br>  0.000<br>  0.000<br>  0.000<br>  0.000<br>  0.001<br>  0.000<br>  0.00 | 9.954   9.956   in 7 iterations.   f'(xn)   -5.100   -5.088   -5.110   in 3 iterations.   f'(xn)   1.500   -5.063   -5.114   -5.110   in 4 iterations.   f'(xn)   1.510   in 4 iterations.   f'(xn)   1.510  | 0.104<br>0.010<br>0.000<br>Error<br>0.500<br>0.062<br>0.020<br>0.000<br>Error<br>0.333<br>0.615<br>0.054<br>0.022<br>0.000<br>Error                                     |

| n   | a   | b  | с  | f(a)   | f(b)  | f(c)  | Error   |
|---|---|--|--|--|---|---|---|
| 0   | 0.000   | 1.000  | 0.625  | -5.000   | 3.000   | 1.980   | 1.000   |
| 1   | 0.000   | 0.625  | 0.448  | -5.000   | 1.980   | 0.758   | 0.396   |
| 2   | 0.000   | 0.448  | 0.389  | -5.000   | 0.758   | 0.230   | 0.152   |
| 3   |   |  |  |  |   |   |   |
|   | 0.000   | 0.389  | 0.372  | -5.000   | 0.230   | 0.065   | 0.046   |
| 4   | 0.000   | 0.372  | 0.367  | -5.000   | 0.065   | 0.018   | 0.013   |
| 5   | 0.000   | 0.367  | 0.366  | -5.000   | 0.018   | 0.005   | 0.004   |
| FALSE-PO  | SITION - The roo  | t 0.366 has been   | found in between   | n 0 and 1 for fu   | nction #1 in 5 i  | terations.  |   |
| n   | a   | l b  | с  | f(a)   | f(b)  | f(c)  | Error   |
|   | 1 000   |  | 1 000  |  |   |   | 1 000   |
| 0   | 1.000   | 2.000  | 1.882  | 3.000  | -0.400  | 0.201   | 1.000   |
| 1   | 1.882   | 2.000  | 1.922  | 0.201  | -0.400  | 0.000   | 0.020   |
| 2   | 1.922   | 2.000  | 1.922  | 0.000  | -0.400  | 0.000   | 0.000   |
| FALSE-PO  | SITION - The roo  | t 1.922 has been   | found in between   | n 1 and 2 for fu   | nction #1 in 2 i  | terations.  |   |
| n   | a   | b  | С  | f(a)   | f(b)  | f(c)  | Error   |
|   |   |  | 4 057  |  |   |   |   |
| 0   | 2.000   | 3.000  | 1.857  | -0.400   | -3.200  | 0.329   | 1.000   |
| 1   | 2.000   | 1.857  | 1.922  | -0.400   | 0.329   | 0.001   | 0.034   |
| 2   | 2.000   | 1.922  | 1.922  | -0.400   | 0.001   | 0.000   | 0.000   |
| FALSE-PO  | SITION - The roo  | t 1.922 has been   | found in between   | n 2 and 3 for fu   | nction #1 in 2 i  | terations.  |   |
| n   | a   | b  | с  | f(a)   | f(b)  | f(c)  | Error   |
| 0   | 3.000   | 4.000  | 3.327  |  | 6.600   | <br>  -1.969  | 1.000   |
| 1   | 3.327   | 4.000  | 3.481  | -1.969   | 6.600   | -0.796  | 0.044   |
|   |   |  |  |  |   |   | :   |
| 2   | 3.481   | 4.000  | 3.537  | -0.796   | 6.600   | -0.267  | 0.016   |
| 3   | 3.537   | 4.000  | 3.555  | -0.267   | 6.600   | -0.084  | 0.005   |
| FALSE-PO  | SITION - The roo  | t 3.555 has been   | found in between   | n 3 and 4 for fu   | nction #1 in 3 i  | terations.  |   |
| n   | xn-1  | xn   | f(xn-1)  | f(xn)  | f(x+delta*x)  | f'(xn)  | Error   |
| 0   | 0.000   | 1.000  | -5.000   | 3.000  | 3.002   | 0.300   | 1.000   |
| 1   | 1.000   | -11.336  | 3.000  | -4622.118  | -4742.612   | 1053.916  | 1.088   |
| 2   | -11.336   | -6.987   | -4622.118  | -1382.148  | -1415.539   | 474.132   | 0.622   |
| 3   | -6.987  | -4.095   | -1382.148  | -411.030   | -419.860  | 214.141   | 0.706   |
| 4   |   |  |  |  |   |   | :   |
|   | -4.095  | -2.189   | -411.030   | -120.774   | -122.924  | 97.667  | 0.871   |
| 5   | -2.189  | -0.959   | -120.774   | -34.505  | -34.944   | 45.663  | 1.282   |
| 6   | 1 0 050   | -0.206   | -34.505  | -9.166   | -9.213  | 22.782  | 3.650   |
| 6   | -0.959  | 0.196  | -9.166   | -1.970   | -1.944  | 13.352  | 2 054   |
| 7   | -0.206  | 0.150  |  |  |   |   | 2.054   |
|   |   | 0.343  | -1.970   | -0.220   | -0.185  | 10.372  | 0.430   |
| 7<br>8  | -0.206<br>0.196   | 0.343  |  |  |   |   | 0.430   |
| 7<br>8<br>9   | -0.206<br>  0.196<br>  0.343  | 0.343<br>0.365   | -0.220   | -0.004   | 0.033   | 9.963   | 0.430<br>0.058  |
| 7<br>8<br>9<br>10   | -0.206<br>0.196   | 0.343<br>0.365<br>0.365  | -0.220<br>-0.004   | -0.004<br>  0.000  | 0.033<br>0.036  | 9.963<br>9.956  | 0.430   |
| 7<br>8<br>9<br>10<br>MODIFIED   | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roo   | 0.343<br>0.365<br>0.365<br>0.365<br>ot 0.365 has been  | -0.220<br>  -0.004<br>n found for funct  | -0.004<br>  0.000<br>tion #1 starting  | 0.033<br>0.036<br>at x = 1 in 10  | 9.963<br>9.956<br>iterations.   | 0.430<br>0.058<br>0.001   |
| 7<br>8<br>9<br>10   | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roo   | 0.343<br>  0.365<br>  0.365<br>ot 0.365 has been<br>  xn   | -0.220<br>  -0.004<br>n found for funct<br>  f(xn-1)   | -0.004<br>  0.000  | 0.033<br>0.036  | 9.963<br>9.956<br>iterations.   | 0.430<br>0.058  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The root  | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000   | -0.220<br>  -0.004<br>n found for funct<br>  f(xn-1)<br>  3.000  | -0.004<br>  0.000<br>tion #1 starting<br>  f(xn)<br>  -0.400   | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100   | 0.430<br>  0.058<br>  0.001<br>  Error  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roo   | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921  | -0.220<br>  -0.004<br>n found for funct<br>  f(xn-1)<br>  3.000<br>  -0.400  | -0.004<br>  0.000<br>tion #1 starting<br>  f(xn)<br><br>  -0.400<br>  0.001  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097  | 9.963<br>9.956<br>iterations.   | 0.430<br>  0.058<br>  0.001   |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The root  | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000   | -0.220<br>  -0.004<br>n found for funct<br>  f(xn-1)<br>  3.000  | -0.004<br>  0.000<br>tion #1 starting<br>  f(xn)<br>  -0.400   | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100   | 0.430<br>  0.058<br>  0.001<br>  Error  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br><br>0<br>1<br>2   | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The rol<br>  xn-1<br>  1.000<br>  2.000   | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922   | -0.220<br>  -0.004<br>  found for funct<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.001   | -0.004<br>  0.000<br>tion #1 starting<br>  f(xn)<br>  -0.400<br>  0.001<br>  0.000   | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110   | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br><br>0<br>1<br>2   | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The root<br>  xn-1<br>  1.000<br>  2.000<br>  1.921   | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922   | -0.220<br>  -0.004<br>  found for funct<br>  f(xn-1)<br>  3.000<br>  -0.400<br>  0.001   | -0.004<br>  0.000<br>tion #1 starting<br>  f(xn)<br>  -0.400<br>  0.001<br>  0.000   | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.   | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The room   xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The room   xn-1  | 0.343<br>  0.365<br>  0.365<br>  ot 0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been  | -0.220<br>-0.004<br>n found for funct<br>  f(xn-1)<br>-0.400<br>  0.001<br>n found for funct<br>  f(xn-1)  | -0.004 0.000 tion #1 starting f(xn) -0.400 0.001 0.000 tion #1 starting  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>   | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000   |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roo<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roo<br>  xn-1  | 0.343<br>  0.365<br>  0.365<br>  ot 0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn  | -0.220 -0.004 n found for funct   f(xn-1)   3.000   -0.400   0.001 n found for funct   f(xn-1)   -0.400  | -0.004 0.000 tion #1 starting f(xn) -0.400 0.001 0.000 tion #1 starting f(xn) -1.3.200   | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)   | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000  | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893   | -0.220 -0.004 n found for funct   f(xn-1)   3.000   -0.400   0.001 n found for funct   f(xn-1)   -0.400   -0.400   -0.400  | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)   | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n                                      | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000<br>  4.893   | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143  | -0.220 -0.004 n found for funct    f(xn-1)   3.000 -0.400 0.001 n found for funct    f(xn-1)   -0.400 -3.200 35.763  | -0.004 0.000 tion #1 starting f(xn) -0.400 0.001 0.000 tion #1 starting f(xn) -3.200 35.763 9.730  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097<br>  10.737  | 9.963<br>  9.956<br>  iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181   |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>                                  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000<br>  4.893<br>  4.143  | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742   | -0.220 -0.004 n found for funct    f(xn-1)   3.000 -0.400 0.001 n found for funct    f(xn-1)   -0.400 -3.200 35.763 9.730  | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097<br>  10.737<br>  2.748   | 9.963<br>  9.956<br>  19.956<br>  10.000   10. | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107                                  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>                                  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000<br>  4.893   | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143  | -0.220 -0.004 n found for funct    f(xn-1)   3.000 -0.400 0.001 n found for funct    f(xn-1)   -0.400 -3.200 35.763  | -0.004 0.000 tion #1 starting f(xn) -0.400 0.001 0.000 tion #1 starting f(xn) -3.200 35.763 9.730  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097<br>  10.737  | 9.963<br>  9.956<br>  iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181   |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>                                  | -0.206   0.196   0.343   0.365   SECANT - The room   xn-1   1.000   2.000   1.921   SECANT - The room   xn-1   2.000   3.000   4.893   4.143   3.742   3.591  | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  t.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  3.565   | -0.220 -0.004 n found for funct    f(xn-1) -0.400 0.001 n found for funct    f(xn-1) -0.400 -3.200 35.763 9.730 2.203 0.300  | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203   0.300   0.016  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 in 2 in 3 in 3 in 3 in 3 in 3 in  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739<br>  14.159<br>  11.043<br>  10.529  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107                                  |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>                                  | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The room   xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The room   xn-1<br>  2.000<br>  3.000<br>  4.893<br>  4.143<br>  3.742   | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  t.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  3.565   | -0.220 -0.004 n found for funct    f(xn-1) -0.400 0.001 n found for funct    f(xn-1) -0.400 -3.200 35.763 9.730 2.203 0.300  | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203   0.300   0.016  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 in 2 in 3 in 3 in 3 in 3 in 3 in  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739<br>  14.159<br>  11.043<br>  10.529  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107<br>  0.042                       |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>                                  | -0.206   0.196   0.343   0.365   SECANT - The room   xn-1   1.000   2.000   1.921   SECANT - The room   xn-1   2.000   3.000   4.893   4.143   3.742   3.591  | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  t.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  3.565   | -0.220 -0.004 n found for funct    f(xn-1) -0.400 0.001 n found for funct    f(xn-1) -0.400 -3.200 35.763 9.730 2.203 0.300  | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203   0.300   0.016  | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 in 2 in 3 in 3 in 3 in 3 in 3 in  | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739<br>  14.159<br>  11.043<br>  10.529<br>terations.  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107<br>  0.042                       |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>2<br>3<br>4<br>5<br>MODIFIED      | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  SECANT - The roll   | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  3.565<br>  ot 3.565 has been  | -0.220 -0.004 n found for funct    f(xn-1)   3.000 -0.400 0.001 n found for funct    f(xn-1)   -0.400 -3.200 35.763 9.730 2.203 0.300 n found for funct    f(xn-1)   | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203   0.300   0.016 tion #1 starting   | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097<br>  10.737<br>  2.748<br>  0.710<br>  0.404<br>  at x = 3 in 5 i:   | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739<br>  14.159<br>  11.043<br>  10.529<br>terations.  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107<br>  0.042<br>  0.007            |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>2<br>3<br>4<br>5<br>MODIFIED      | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  SECANT - The roll<br>  xn-1<br>  xn-1                       | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  3.565<br>  xn<br>  3.565 has been<br>  xn   | -0.220 -0.004 n found for funct    f(xn-1)   3.000 -0.400 0.001 n found for funct    f(xn-1)   -0.400 -3.200 35.763 9.730 2.203 0.300 n found for funct    f(xn-1)   -0.400 -3.200 -3.200 -3.200 -3.200 -3.200 -3.200 -3.200 | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203   0.300   0.016 tion #1 starting   f(xn)   f(xn)   | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097<br>  10.737<br>  2.748<br>  0.710<br>  0.404<br>  at x = 3 in 5 i:<br>  f(x+delta*x)                         | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739<br>  14.159<br>  11.043<br>  10.529<br>terations.<br>  f'(xn)  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107<br>  0.042<br>  0.007            |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>1<br>2<br>3<br>4<br>5<br>MODIFIED | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  SECANT - The roll<br>  xn-1<br>  xn-1<br>  3.000<br>  4.000 | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  3.565<br>  xn<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn | -0.220 -0.004 n found for funct    f(xn-1)   3.000 -0.400 0.001 n found for funct    f(xn-1)   -0.400 -3.200 35.763 9.730 2.203 0.300 n found for funct    f(xn-1)   -3.200 6.600  | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203   0.300   0.016 tion #1 starting   f(xn)   f(xn)   -3.200   3.300   0.016 tion #1 starting | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097<br>  10.737<br>  2.748<br>  0.710<br>  0.404<br>  at x = 3 in 5 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097 | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739<br>  14.159<br>  11.043<br>  10.529<br>terations.<br>  f'(xn)  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107<br>  0.042<br>  0.007<br>  Error |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>2<br>3<br>4<br>5<br>MODIFIED      | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  SECANT - The roll<br>  xn-1<br>  xn-1                       | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  3.565<br>  xn<br>  3.565 has been<br>  xn   | -0.220 -0.004 n found for funct    f(xn-1)   3.000 -0.400 0.001 n found for funct    f(xn-1)   -0.400 -3.200 35.763 9.730 2.203 0.300 n found for funct    f(xn-1)   -0.400 -3.200 -3.200 -3.200 -3.200 -3.200 -3.200 -3.200 | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203   0.300   0.016 tion #1 starting   f(xn)   f(xn)   | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097<br>  10.737<br>  2.748<br>  0.710<br>  0.404<br>  at x = 3 in 5 i:<br>  f(x+delta*x)                         | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739<br>  14.159<br>  11.043<br>  10.529<br>terations.<br>  f'(xn)  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107<br>  0.042<br>  0.007            |
| 7<br>8<br>9<br>10<br>MODIFIED<br>n<br>2<br>MODIFIED<br>n<br>2<br>3<br>4<br>5<br>MODIFIED      | -0.206<br>  0.196<br>  0.343<br>  0.365<br>  SECANT - The roll<br>  xn-1<br>  1.000<br>  2.000<br>  1.921<br>  SECANT - The roll<br>  xn-1<br>  2.000<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  SECANT - The roll<br>  xn-1<br>  xn-1<br>  3.000<br>  4.000 | 0.343<br>  0.365<br>  0.365<br>  0.365 has been<br>  xn<br>  2.000<br>  1.921<br>  1.922<br>  1.922 has been<br>  xn<br>  3.000<br>  4.893<br>  4.143<br>  3.742<br>  3.591<br>  3.565<br>  xn<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  xn been<br>  3.665 has been<br>  xn | -0.220 -0.004 n found for funct    f(xn-1)   3.000 -0.400 0.001 n found for funct    f(xn-1)   -0.400 -3.200 35.763 9.730 2.203 0.300 n found for funct    f(xn-1)   -3.200 6.600  | -0.004   0.000 tion #1 starting   f(xn)   -0.400   0.001   0.000 tion #1 starting   f(xn)   -3.200   35.763   9.730   2.203   0.300   0.016 tion #1 starting   f(xn)   f(xn)   -3.200   3.300   0.016 tion #1 starting | 0.033<br>  0.036<br>  at x = 1 in 10 :<br>  f(x+delta*x)<br>  -0.502<br>  -0.097<br>  -0.098<br>  at x = 2 in 2 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097<br>  10.737<br>  2.748<br>  0.710<br>  0.404<br>  at x = 3 in 5 i:<br>  f(x+delta*x)<br>  -3.149<br>  38.097 | 9.963<br>  9.956<br>iterations.<br>  f'(xn)<br>  -5.100<br>  -5.110<br>  -5.110<br>terations.<br>  f'(xn)<br>  1.500<br>  46.838<br>  23.739<br>  14.159<br>  11.043<br>  10.529<br>terations.<br>  f'(xn)  | 0.430<br>  0.058<br>  0.001<br>  Error<br>  0.500<br>  0.041<br>  0.000<br>  Error<br>  0.333<br>  0.387<br>  0.181<br>  0.107<br>  0.042<br>  0.007<br>  Error |

## FUNCTION #2: $f(x) = x + 10 - x\cosh(50/x)$

| n  | a                | l b              | c              | f(a)              | f(b)              | f(c)           | Error |
|--|------------------|------------------|----------------|-------------------|-------------------|----------------|-------|
| 0  | 120.000          | l 130.000        | 125.000        | -0.568            | 0.265             | -0.134         | 1.000 |
| 1  | 125.000          | 130.000          | 127.500        | -0.134            | 0.265             | 0.070          | 0.020 |
| 2  | 125.000          | 127.500          | 126.250        | -0.134            | 0.070             | -0.031         | 0.010 |
| BISECTIO   | N - The root 126 | .250 has been fo | und in between | 120 and 130 for   | function #2 in 2  | iterations.    | ·     |
|  |                  |                  |                |                   |                   |                |       |
| n  | xn               | f(xn)            | f'(xn)         | Error             |                   |                |       |
|  |                  |                  |                |                   |                   |                |       |
| 0  | 130.000          | 0.265            | 0.077          | 1.000             |                   |                |       |
| 1  | 126.540          | -0.008           | 0.081          | 0.027             |                   |                |       |
| 2  | 126.632          | -0.000           | 0.081          | 0.001             |                   |                |       |
| NEWTON -   | The root 126.63  | 2 has been found | for function   | #2 starting at x  | = 130 in 2 iterat | ions.          |       |
|  |                  |                  |                |                   |                   |                |       |
| n  | xn-1             | xn               | f(xn-1)        | f(xn)             | f'(xn)            | Error          |       |
|  |                  |                  |                |                   |                   |                |       |
| 0  | 120.000          | 130.000          | -0.568         | 0.265             | 0.077             | 0.077          |       |
| 1  | 130.000          | 126.816          | 0.265          | 0.015             | 0.081             | 0.025          |       |
| 2  | 126.816          | 126.627          | 0.015          | -0.000            | 0.081             | 0.001          |       |
| SECANT -   | The root 126.62  | 7 has been found | for function   | #2 starting at x  | = 130 in 2 iterat | ions.          |       |
|  |                  |                  |                |                   |                   |                |       |
| n  | a                | b                | c              | f(a)              | f(b)              | f(c)           | Error |
|  |                  |                  |                |                   |                   |                |       |
| 0  | 120.000          | 130.000          | 126.816        | -0.568            | 0.265             | 0.015          | 1.000 |
| 1  | 120.000          | 126.816          | 126.642        | -0.568            | 0.015             | 0.001          | 0.001 |
| FALSE-PO   | SITION - The roo | t 126.642 has be | en found in be | tween 120 and 130 | for function #2   | in 1 iteration | s     |
|  |                  |                  |                |                   |                   |                |       |
| n  | xn-1             | l xn             | f(xn-1)        | f(xn)             | f(x+delta*x)      | f'(xn)         | Error |
|  |                  |                  |                | ,                 |                   |                |       |
| 0  | 120.000          | 130.000          | -0.568         | 0.265             | 0.364             | 0.077          | 0.077 |
| 1  | 130.000          | 126.504          | 0.265          | -0.010            | 0.091             | 0.081          | 0.028 |
| 2  | 126.504          | 126.634          | -0.010         | 0.000             | 0.102             | 0.081          | 0.001 |
| _  |                  | •                |                |                   |                   | •              |       |
| MODIFIED SECANT - The root 126.634 has been found for function #2 starting at $x = 130$ in 2 iterations. |                  |                  |                |                   |                   |                |       |

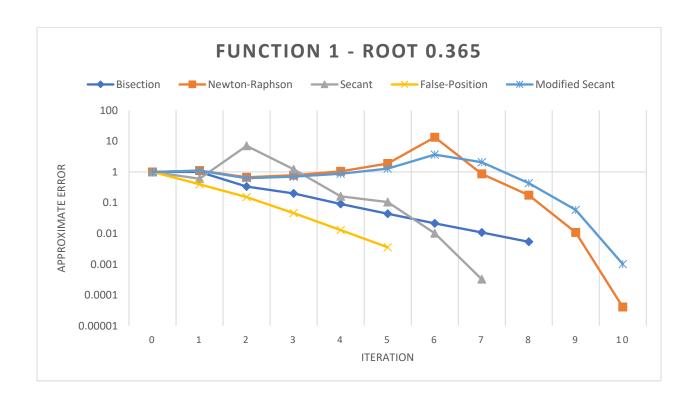


Table 1: Starting Points for Function 1 - Root 0.365

| Bisection       | a = 0, b = 1 |
|-----------------|--------------|
| Newton-Raphson  | x = 1        |
| Secant          | x = 1        |
| False-Position  | a = 0, b = 1 |
| Modified Secant | x = 1        |



Table 2: Starting Points for Function 1 - Root 1.922

| Bisection       | a = 1, b = 2 |
|-----------------|--------------|
| Newton-Raphson  | x = 2        |
| Secant          | x = 3        |
| False-Position  | a = 1, b = 2 |
| Modified Secant | x = 2        |

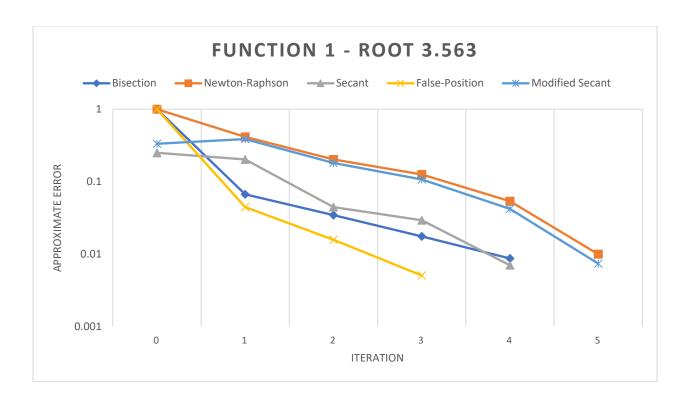


Table 3: Starting Points for Function 1 - Root 3.563

| Bisection       | a = 3, b = 4 |
|-----------------|--------------|
| Newton-Raphson  | x = 3        |
| Secant          | x = 4        |
| False-Position  | a = 3, b = 4 |
| Modified Secant | x = 3        |

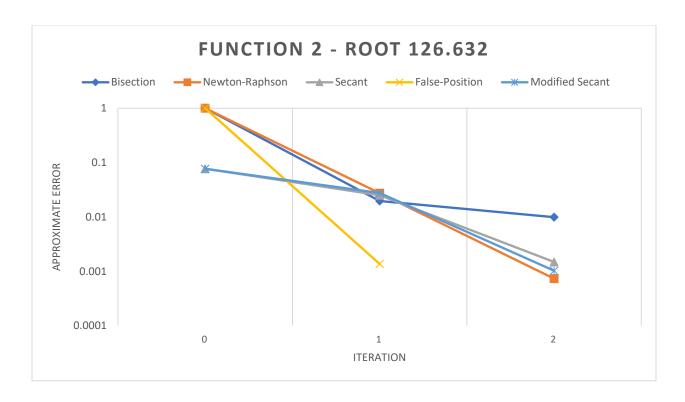


Table 4: Starting Points for Function 2 - Root 126.632

| Bisection       | a = 120, b = 130 |
|-----------------|------------------|
| Newton-Raphson  | x = 130          |
| Secant          | x = 130          |
| False-Position  | a = 120, b = 130 |
| Modified Secant | x = 130          |