DEPARTMENT OF MATHEMATICS

BIRLA INSTITUTE OF TECHNOLOGY MESRA, RANCHI

IMM5002 Numerical Method Lab, Session: (MO-19)

Lab Assignment - 4

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1. Find the approximations to within 10^{-4} to all real zeros of the following polynomials using Newton's and secant method.

   (a) $f(x) = x^3 - 2x^2 - 5$

   (b) $f(x) = x^3 + 4.001x^2 + 4.002x + 1.101$

   (c) $f(x) = x^5 - x^4 + 2x^3 - 3x^2 + x - 4.$

   What can you comment on the number of iterations and accuracy of the two methods based on your run ?

2. Find the root of the function given below by using Newton's method.

   (a) $f(x) = x^3 - 4x^2 + 5x - 2$

   (b) $h(x) = \dfrac{f(x)}{f'(x)}$

   Now, take the initial guess $x_0 = 5$ for both the part (a) and (b). Comment about the speed of convergence.

3. Repeat the Question no. 2 with initial guess $x_0 = -5$. Have you observe any difference. Write your observation in Lab file.

4. Find the root of the equation $e^x - x - 1 = 0$ by modified Newton's method.