Math 781: Project # 2  
Newton’s Method  
(due: Tuesday, 10/7/14)

Write a computer program implementing Newton’s method. Use the program to compute the unique root of

\[ x + e^{-Bx^2} \cos(x) = 0, \]

where \( B > 0 \) is a parameter to be set. Use \( B = 1, 5, 10, 25, 50 \) and various choices of \( x_0 \) (including \( x_0 = 0 \)) and study the behavior of Newton’s method. Theoretically, Newton’s method will converge for any value of \( x_0 \) and \( B \), but it may behave differently in practice due to rounding error. Compare the theoretical prediction with actual computations for large values of \( B \).

Turn in your report. The requirement for the report is the same as in Project # 1.