Numerical Computation
Assignment 1

1. Find the Taylor series generated by $f(x) = 1/x$ at $a = 2$.

2. Find the Taylor polynomials of order 5 generated by $f(x) = \cos x$ at $x = 0$.

3. Find the Maclaurin series for the function $f(x) = xe^x$.

4. Find the Taylor polynomials of orders 0,1,2, and 3 generated by $f(x) = \ln x$ at $a = 1$. Calculate all polynomials value and the actual value (by calculator) when $x = 1.5$.

5. Let $f(x)$ have derivatives through order n at $x = a$. Show that the Taylor polynomial of order n and its first n derivatives have the same values that f and its first n derivatives have at $x = a$.