Assignment 2

1. Write a program to calculate the value of a one-variable polynomial (which is provided as an array or list). Ensure that the program uses right-to-left summation.

2. Write a program to calculate the N-th partial sum of any *one* of the series for $\log(1+x)$, $\tan^{-1}(x)$, $\sin^{-1}(x)$ for x such that $|x| < 1/2$. (Use the previous program for polynomial evaluation).

3. Compare the results of (3) for different values of N with the built-in values and see for what value of N you get good results. Does this match with the theoretical value for N?

4. Write a program to calculate a suitable value of s, N and k so that the N-th partial sum of the exponential series will converge uniformly for $|x| < 1/(2^k s)$ to a value within 2^{-kN} of the real value.

5. Use the above values to write a program to calculate a good approximation of the series for any *one* of $\exp(x)$, $\sin(x)$, $\cos(x)$.

6. Compare the results of (6) for different values of N with the built-in values and see for what value of N you get good results. Does this match with the theoretical value for N?

7. Use the above series to calculate values of the functions *outside* the given range by making use of additivity properties of the functions. Once again compare with built-in values.