**CLL:113-Tut-1**

***Truncation Error:***

1. Determine the number of terms necessary to approximate cos x to 8 significant figures using the Maclaurin series approximation:

Calculate the approximation using a value of x = 0.3π. Write a program to determine your result.

***Round-off Error:***

2.The infinite series

converges on a value of f (n) = π4/90 as n approaches infinity. Write a program in single precision to calculate f (n) for n = 10,000 by computing the sum from i = 1 to 10,000. Then repeat the calculation but in reverse order—that is, from i = 10,000 to 1 using increments of −1. In each case, compute the true percent relative error. Explain the results.

***Total Error in Iterative Methods***

The “divide and average” method, an old-time method for approximating the square root of any positive number a, can be formulated as

Write a computer program to evaluate the true percent relative error and the approximate percent relative error as a function of iteration steps, for a=5 and x0 =0.005 if εtol=10-6 .