Numerical Methods Midterm Answers:

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1)

import math

act = "y"

while act == "Y" or act == 'y':

true = ((math.pi\*\*4)/90)

p = int(input('Enter number of iterations (n): '))

z = 0

for i in range(1, p):

z = z + 1/i\*\*4

print('The approximation value is: ', z)

absval = (true - z)/true

print('The absolute value percent error: ', absval)

z2 = 0

for i in range(p, 1, -1):

z2 = z2 + 1/i\*\*4

print('The approximation value backwards is: ', z2)

absval2 = (true - z2)/true

print('The absolute value percent error: ', absval2)

act = input('Continue?: ')

2)

function Vol = tankvolume(R, d)

if d < R

Vol = pi \* d ^ 3 / 3;

elseif d <= 3 \* R

V1 = pi \* R ^ 3 / 3;

V2 = pi \* R ^ 2 \* (d - R);

Vol = V1 + V2;

else

Vol = 'overtop';

End

3)

#include <stdio.h>

int main(void)

{

int k;

float x,

epsilon,

sum,

term;

scanf("%f %f", &x, &epsilon);

sum = term = 1, k = 0;

while (term >= epsilon && -term <= epsilon)

// while abs(term) is smaller than epsilon

{

k += 2;

term \*= -(x\*x)/(k\*(k-1));

sum += term;

}

printf("cos(%f) = %f\n", x, sum);

return 0;

}

4)

static void Main(string[] args)

{

Console.Write("Binary : ");

string s = Console.ReadLine();

int dec = 0;

for (int i = 0; i < s.Length; i++)

{

if (s[s.Length - i - 1] == '0') continue;

dec += (int)Math.Pow(2, i);

}

Console.WriteLine(dec);

}