%8.2

%(a)

clear

terms = 500;

pi = 0;

sign = 1;

for n = 1 : terms

pi = pi + sign \* 4 / (2 \* n - 1);

%公式8.4 pi=4(1-1/3+1/5-1/7+1/9...)

sign = sign \* (-1);

end

pi

%(b)

clear

terms = 500;

pi = 0;

for n = 1 : terms

pi = pi + 8 / ((4 \* n - 3) \* (4 \* n - 1));

end

pi

%(c)

clear

pi=4\*(6\* arctan(1/8) +2\*arctan(1/57) +arctan(1/239) )

% Function file arctan.m

function y = arctan(x) %課本公式(8.5)

terms = 100;sign=1;y=0;

for n = 1 :2:terms

y = y + sign\* (x^n)/n;

sign = sign \* (-1);

end

%(d)

% vectorization of (a)

clear

n=1: 2: terms;

pi = 4\*(sum(1./(2\*n-1)) - sum(1./(2\*n+1)))

% vectorization of (b)

clear

n=1: terms;

pi = 8\*( sum(1./((4 \* n - 3) .\* (4 \* n - 1))) )

%8.4

clear

clc;clear all;

x1=-1:0.2:1;

y1=x1.\*(sin(pi\*(1+20\*x1)/2));

plot(x1,y1,'g');hold on;

x2=-1:0.1:1;

y2=x2.\*(sin(pi\*(1+20\*x2)/2));

plot(x2,y2,'b');hold on;

x3=-1:0.01:1;

y3=x3.\*(sin(pi\*(1+20\*x3)/2));

plot(x3,y3,'r');

%8.8

clear

sum = 0;

terms =1;

while (sum+terms^2) <= 2000

sum = sum + terms^2;

terms = terms + 1;

end

disp( [terms-1, sum] );

%8.9

clear

format bank

for a=[500 2000 10000]

r = 0.1;

bal = a;

year = 0;

disp( 'Year Balance' )

while bal < 2 \* a

bal = bal + r \* bal;

year = year + 1;

disp( [year bal] )

end

end

format

%8.11

clear

x=3;

i=0;

y=0;terms=1;sign=1;

while roundn(cos(x),-4) ~= roundn(y,-4)

disp( 'Terms　Cox(x)' )

disp( [terms y] )

y=y+sign\*x^i/factorial(i);%-x^(i+2)/factorial(i+2)%factorial階乘

i=i+2;

sign=sign\*-1;

terms=terms+1;

end

%8.13

clear

g = 9.81; % Gravity in m/s/s.

vo = 60;%initial velocity

tho = 50;%angle

tho = pi\*tho/180; % Conversion of degrees to radians.

%計算飛行的範圍和持續時間。

txmax = (2\*vo/g) \* sin(tho);

xmax = txmax \* vo \* cos(tho);

%計算軌蹟的時間步長順序

dt = 0.5; %間格秒數

t = 0:dt:txmax;

%計算軌跡

x = (vo \* cos(tho)) .\* t;

y = (vo \* sin(tho)) .\* t - (g/2) .\* t.^2;

plot(x,y,'-o');

title(['Projectile flight path: v\_o = ', num2str(vo),' m/s' ...

', \theta\_o = ', num2str(180\*tho/pi),' degrees'])

xlabel('x'), ylabel('y') % Plot of Figure 3.4.

disp('在空中秒數 離原點水平距離 垂直距離 ');

disp([t' x' y']);