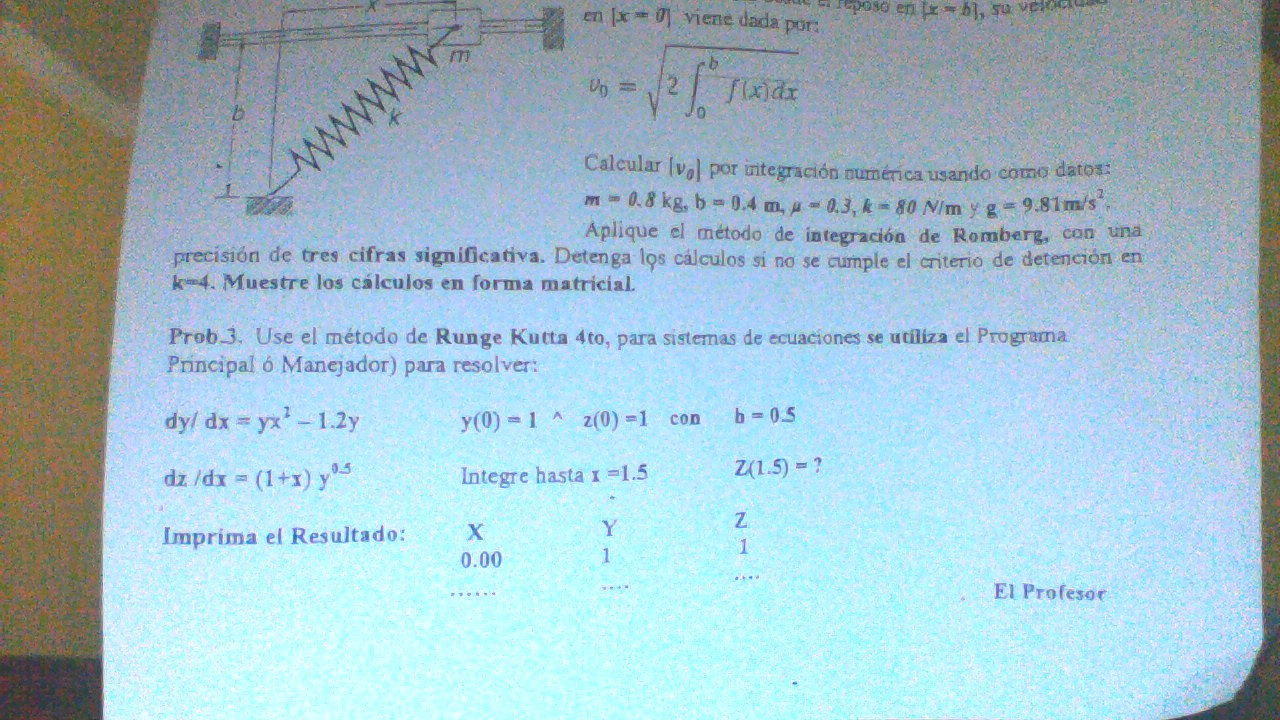
Cristhian Tuni Castro



Solucion

PROGRAMA DE RUNGE KUTTA PARA 2 ECUACIONES

function [dY]=WDerivs(X,Y,EDO1,EDO2)

Y1=Y(1);

dY(1)=EDO1(X,Y1);

Y1=Y(1);Y2=Y(2);

dY(2)=EDO2(Y1,Y2,X);

end

function [X,Y]=WRK4(X,Y,n,h,EDO1,EDO2)

[k1]=WDerivs(X,Y,EDO1,EDO2);

for i=1:n

Ym(i)=Y(i)+ k1(i)\*(h/2);

end

[k2]=WDerivs(X+h/2,Ym,EDO1,EDO2);

for i=1:n

Ym(i)=Y(i)+ k2(i)\*(h/2);

end

[k3]=WDerivs(X+h/2,Ym,EDO1,EDO2);

for i=1:n

Ye(i)=Y(i)+ k3(i)\*h;

end

[k4]=WDerivs(X+h,Ye,EDO1,EDO2);

for i=1:n

slope(i)=(k1(i)+2\*(k2(i)+k3(i))+k4(i))/6;

Y(i)=Y(i)+slope(i)\*h;

end

X=X+h;

end

function [X,Y]=WIntegrator(X,Y,n,h,Xend,EDO1,EDO2)

while X < Xend

%disp('XD')

if (Xend - X)<h %para el ultiomo segmento

h = Xend - X;

end

%disp('XD')

%disp(X)

[X,Y]=WRK4(X,Y,n,h,EDO1,EDO2);

end

clear all

clc

disp('====================================')

disp('Runge kutta 4 orden para 2 ecuaciones')

disp('====================================')

EDO1='Y1\*X^2-1.2\*Y1';

syms X Y1 Y2

EDO1=inline(EDO1);

EDO2='(1+X)\*Y1^0.5+Y2\*0';

syms X Y1 Y2

EDO2=inline(EDO2);

n=2; %input('Numero de ecuaciones, "n": ');

Yo=[1 1]; %input('Valores iniciales de n variables dependientes, "Yo": ');

Xo=0; %input('Valor inicial de independiente, "Xo": ');

Xf=4; %input('Valor final de independiente, "Xf": ');

dX=0.5; %input('Tamaño de paso, "dX": ');

Xout=0.5; %input('Intervalo de salida: ');

X=Xo;

m=1;

Xp(m)=X;

fprintf('\n \t X \t \t \tY1\t \t \tY2\t|');

for i=1:n

Yp(i,m)=Yo(i);

Y(i)=Yo(i);

end

while X < Xf

if m==1

Xend=X;

else

Xend= X+Xout;

end

if Xend > Xf

Xend = Xf;

end

h=dX;

[X,Y]=WIntegrator(X,Y,n,h,Xend,EDO1,EDO2);

m=m+1;

Xp(m)=X;

for i=1:n

Yp(i,m)=Y(i);

end

fprintf('\n %1.2f \t%2.4f \t%2.4f',Xp(m) , Yp(1,m), Yp(2,m))

end

%display results

fprintf('\n')

COMPILACION

