clear

xn=0;yn=1;%initial condition

h=0.01;%step size

x=0:h:1;%define x

l=length(x);

y(1)=yn;

yt=exp(2\*x);%true solution

for i=1:l

%RK3

K1=fxy(x(i),y(i));

K2=fxy(x(i)+h/2,y(i)+h/2\*K1);

K3=fxy(x(i)+h,y(i)-h\*K1+2\*h\*K2);

y(i+1)=y(i)+h/6\*(K1+4\*K2+K3);

end

y=y(1:l);

plot(x,y,'-.','LineWidth',5)

hold on

plot(x,yt,'-','LineWidth',2)

legend('RK3','true vlaue')

ylabel('y');xlabel('x');

title('RK3 approximate of ODE')

hold off

sum(abs(yt(:)-y(:)))

function [f]=fxy(x,y)

f=2\*y;

end