clc;

TR=0:0.01:10;

x0=[0;0;0;0];

[t,x]=ode45(@Task3Fun,TR,x0);

th1=x(:,1);

om1=x(:,2);

alpha1=gradient(om1)./gradient(t);

th2=x(:,3);

om2=x(:,4);

alpha2=gradient(om2)./gradient(t);

subplot(2,3,1);

plot(t,th1);xlabel('time');ylabel('theta 1');

subplot(2,3,2);

plot(t,om1);xlabel('time');ylabel('omega 1');

subplot(2,3,3);

plot(t,alpha1);xlabel('time');ylabel('alpha 1')

subplot(2,3,4);

plot(t,th2);xlabel('time');ylabel('theta 2');

subplot(2,3,5);

plot(t,om2);xlabel('time');ylabel('omega 2');

subplot(2,3,6);

plot(t,alpha2);xlabel('time');ylabel('alpha 2')

%%%%%%%%%%%%%%%%%%%%

function dy=Task3Fun(t,y)

T=1;

dy(1)=y(2);

dy(2)=1/5\*(y(4) + 9\*y(3) - 9\*y(2) - 9\*y(1));

dy(3)=y(4);

dy(4)=1/3\*(T+y(2) + 9\*y(1) - y(4) - 12\*y(3));

dy=dy';

end















