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//Espaço de estados
function [y_dot]=deriva(t, y0)
    k=y0(1,:)
    kdot=y0(2,:)
    dk_dt=kdot
    d2k_dt2=-(g/R)*sin(k)
    y_dot=[dk_dt;d2k_dt2]
endfunction

//Item e
//6)
theta0=pi
theta_dot0=1
theta = 0:0.05:2*pi
a=(R*theta_dot0)**2/(2*g)+R*sin(theta0)

//Tempo
t0=0
dt=0.05
tf=10
t=t0:dt:tf

//Integrações
X = ode([theta0;theta_dot0],t0,t,deriva)
Y = integrate('R/sqrt(2*g*(a-R*sin(theta)))','theta',0,theta)

//1) theta(t)
clf()
scf(0)
subplot(121)
title('theta=theta(t)')
xlabel('t(s)')
ylabel('theta(rad)')
plot(t,X(1,:))

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//2) t(theta)
subplot(122)
title('t=t(theta)')
xlabel('theta(rad)')
ylabel('t(s)')
plot(theta,Y)

```