

```
clear all;
clc;

%%%%%%%%%%%%%
% Parameters %
%%%%%%%%%%%%%

t = [0:.01:150]; % t varies from 0 to 150s with a step of 0.01s
g = 9.81; % gravity acc. (m/s^2)
k = [0.000001 .005 .01 .02 .04 .08]; % values of k (1/s) (similar to Fig. 2.8)
% note: k cannot be zero when using
% the equations below!
theta = pi/3; % initial angle (rad) (similar to Fig. 2.8)
v0 = 600; % initial speed (m/s) (similar to Fig. 2.8)

%%%%%%%%%%%%%
% Position %
%%%%%%%%%%%%%

for m=1:size(t,2) % for all times
    for n=1:size(k,2) % for all k's
        x(m,n) = v0*cos(theta)/k(n)*(1 - exp(-k(n)*t(m)));
        y(m,n) = -g*t(m)/k(n) + (k(n)*v0*sin(theta) + g)/k(n)^2*(1 - exp(-k(n)*t(m)));
    end
end

%%%%%%%%%%%%%
% Plotting %
%%%%%%%%%%%%%

plot(x(:,1),y(:,1),x(:,2),y(:,2),x(:,3),y(:,3),x(:,4),y(:,4),x(:,5),y(:,5),x(:,6),y(:,6));
axis([0 4e4 0 2e4])
```