

```

function sled
% Andy Ruina's solution to Tongue and Shepard 3.1.37
% Wednesday Feb 22, 2006

% Initial conditions and time span
tspan= linspace(0,20,100); %Integrate for 20 seconds
z0 = [0 0]'; % initial position and speed both zero

% This one command solves the ODEs
[t z] = ode45(@rhs,tspan,z0);

% Unpack the variables
x = z(:,1); % x is first column of z
v = z(:,2); % v is second column of z

% Plot the results
plot(x,v);
title('Andy Ruina's plot of speed vs position')
xlabel('Position from start in meters')
ylabel('Velocity in meters/s')

end

```

```

%-----
function zdot = rhs(t,z)
% all variables in meters, kg, seconds
x = z(1); v = z(2); % unpack z into readable variables

m = 400; F = 2e5; c = 1600; % given constants

%The next two lines are the heart of this function
%They describe the right hand sides (rhs) of the ODEs.
xdot = v;
vdot = (F - c*v)/m;

z1dot = xdot; z2dot = vdot; % pack up the derivatives

zdot = [z1dot z2dot]'; %This is what the function returns
end
%-----

```

Note to students:

Please type your name as part of your computer commands. Please have part of your computer output be your name. Then circle your name with a colored pen, or highlight it, in both places.

Thanks.

