```matlab
clc; clear all
```
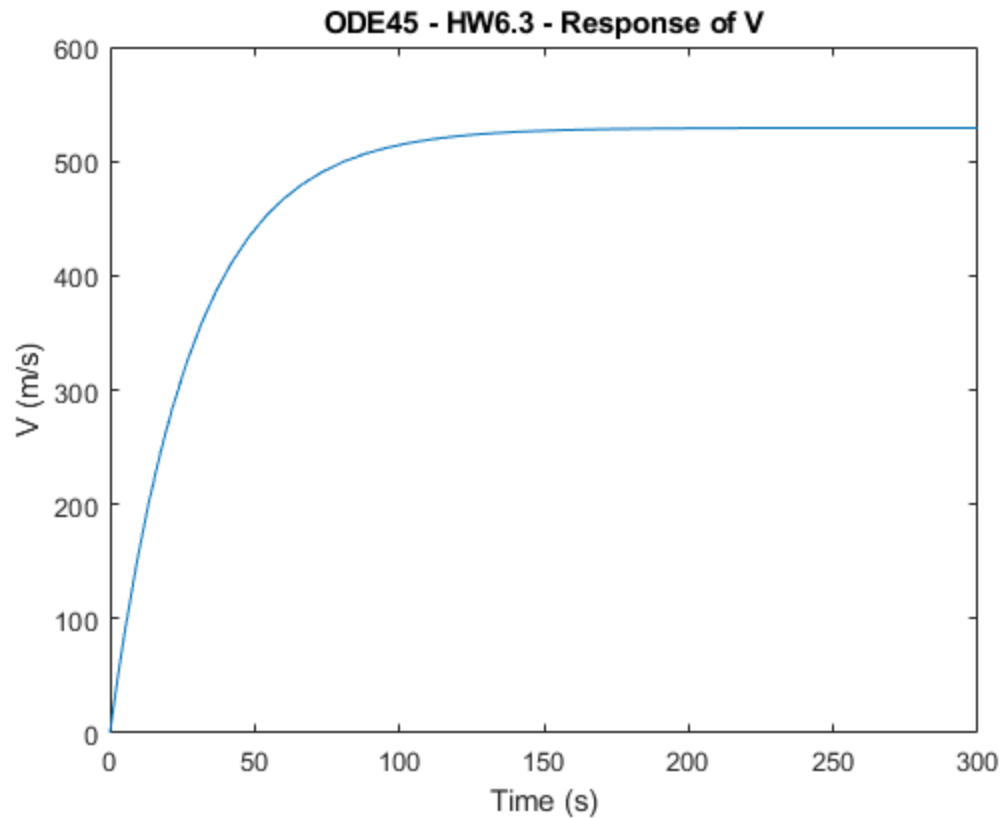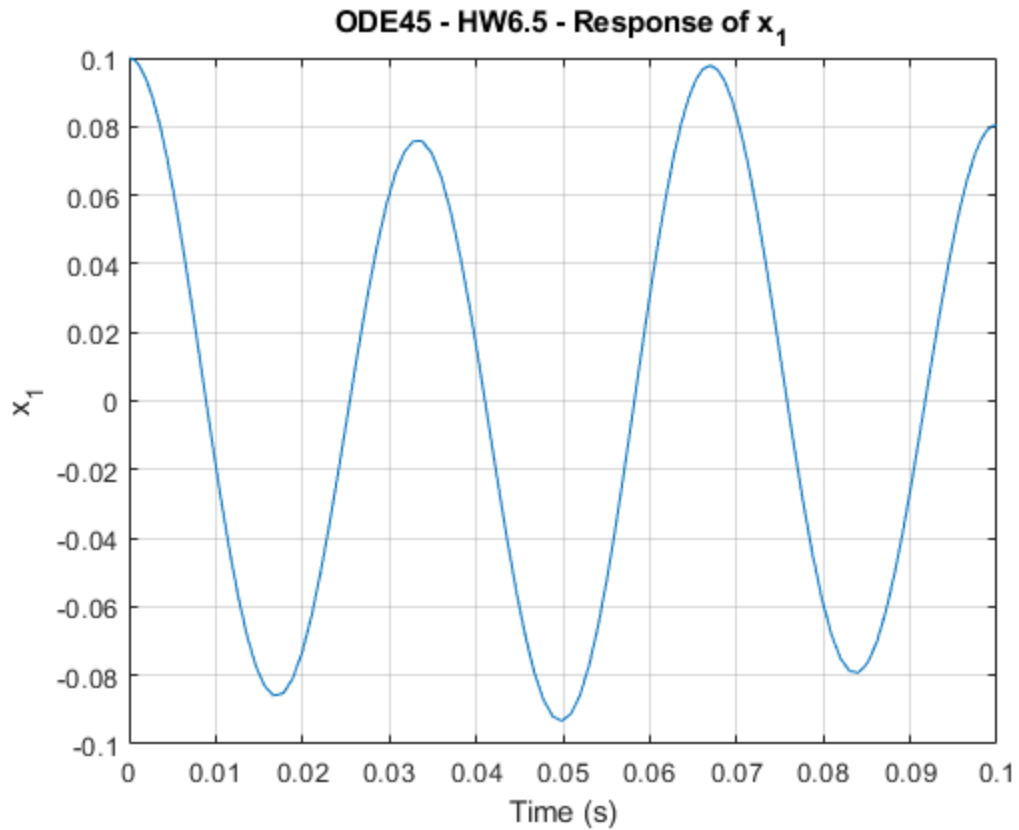
call ode45

```matlab
[t, y] = ode45(@HW63, [0, 300], 0);
figure(1);plot(t, y)
title("ODE45 - HW6.3 - Response of V");
xlabel("Time (s)"); ylabel("V (m/s)");
```


call ODE

```matlab
x0 = [0.1;0;0;0];    % initial conditions
[t,x] = ode45(@HW65, [0,0.1], x0);
figure(2);plot(t,x(:,1));grid on;ylabel('x_1');xlabel('Time (s)');
title("ODE45 - HW6.5 - Response of x_1");
```

ODE45 - HW6.5 - Response of x_1

function for ODE number 3

```
function vdot = HW63(t, v)
    I = 1.1;
    m = 50;
    R = 0.3;
    T = 500;
    ct = 0.2;
    g = 9.81;
    vdot = (T*R - m*g*R^2 - ct*v)/(I + m*R^2);
end
% function for ODE number 5
function [xdot] = HW65(t, x)
    m1 = 1;
    m2 = 3;
    k1 = 16000;
    k2 = 16000;
    k3 = 16000;
    A = [0,0,1,0; 0,0,0,1; -(k1+k2)/m1, k2/m1,0,0; k2/m2, -(k2+k3)/
m2,0,0];
    xdot = A*x;
end
```

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