Problem 1

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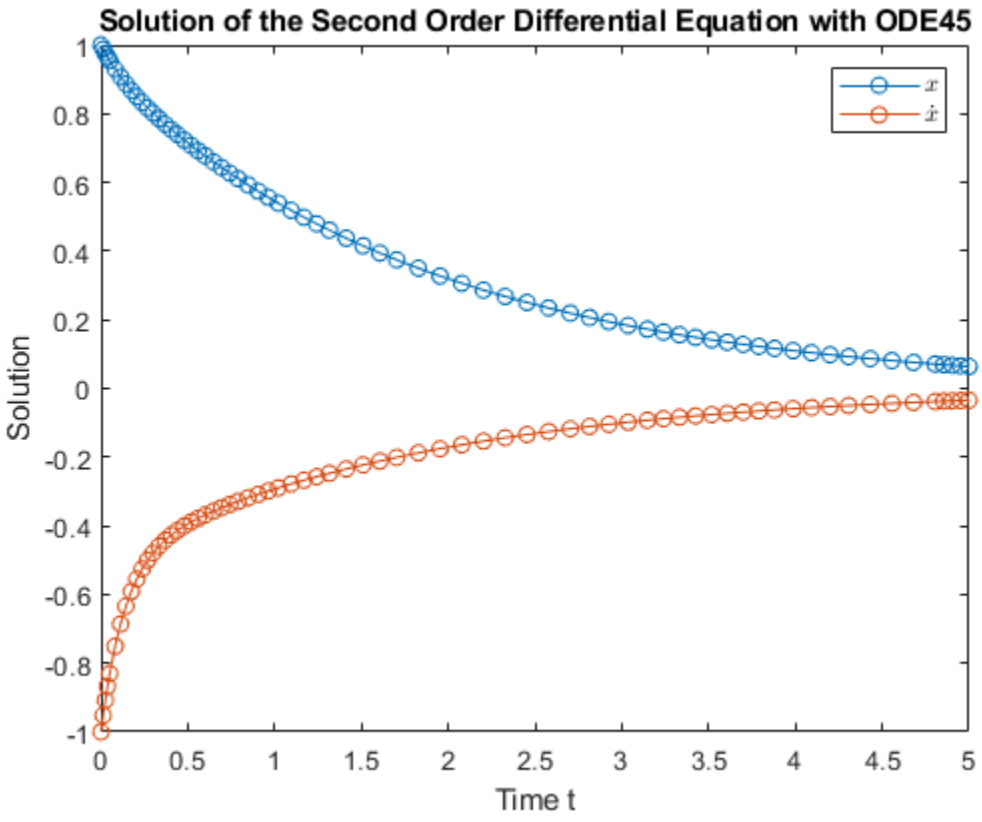
Solve the differential equation

The second parameter specifies the range of t and the third parameter specifies the initial value of x' and x".

```
[t, x] = ode45(@myDiffEqu, [0 5], [1; -1]);
```

Plot

```
plot(t,x(:,1),'-o',t,x(:,2),'-o')
title('Solution of the Second Order Differential Equation with
 ODE45');
xlabel('Time t');
ylabel('Solution');
legend('$x$', '$\dot{x}$', 'Interpreter','latex')
```



Function

```
function dxdt = myDiffEqu(t, x)
    m = 1;
    c = 8;
    k = 4;
    dxdt = [x(2); -(c*x(2)+k*x(1))/m];
end
```

Reference

1. ode45 Documentation from Mathworks: https://www.mathworks.com/help/matlab/ref/ode45.html?lang=en#d123e975456

2. How to use LaTex in legend: https://www.mathworks.com/matlabcentral/answers/21984-tex-latex-math-mode-symbols-in-legends-and-labels-in-matlab-figures

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