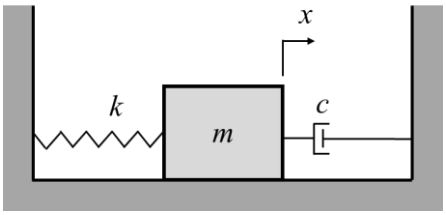
Mass-Spring-Damper System 1 (7+3=10 points)

Build a Simulink model that emulates the Mass-Spring-Damper system below. Test the model with a set of the following parameters and initial conditions. Note $\boldsymbol{x_0 = -5}$, which means that the mass is set to be -5 m from its neutral position and then released.

1. Show the two outputs with one Scope block.

2. Export time and velocity data (toutmck, xdotoutmck) to Workspace.

$\mathbf{m = 10}$
$\boldsymbol{c = 10}$
$\boldsymbol{k = 30}$
$\boldsymbol{x_0 = -5}$



Output

$x -$ Position

$\dot{x} -$ Velocity

States

$x -$ Position

$\dot{x} -$ Velocity

Parameters

$m -$ Mass (10 kg)

$c -$ Damping coefficient (10 N/ (m/s))

$k -$ Spring coefficient (30 N/m)

$x_0 -$ Initial position (-5 m)