1. (10 points) A spring with a mass of 2 kg has damping constant 10. A force of 40 N is needed to keep the spring stretched 5 meters beyond equilibrium. If the spring is compressed 3m and released and if x(t) represents the position of the mass at time t, formulate the IVP that describes this system. **Do not solve it.**

1. (10 points)

$F = kx$

$40 = k(5)$ $\quad k = 8$

$2x'' + 10x' + 8x = 0$

$x(0) = -3$

$x'(0) = 0$