



3. We have made an ansatz (guess) of the equation of motion for a Hooke's law mass, which we hope is the solution to the differential equation of Hooke's law,  $m d^2x/dt^2 = -kx$ .
- Write down the proposed formula for the position as a function of time.
  - To test if the ansatz satisfies the differential equation, we will need to know the acceleration  $d^2x/dt^2$ . From our ansatz for  $x(t)$ , find:
    - The first derivative  $dx/dt$ .
    - The second derivative  $d^2x/dt^2$ .
4. Substitute the ansatz  $x(t)$  and its second derivative  $d^2x/dt^2(t)$  into the Hooke's law differential equation to see if it works.