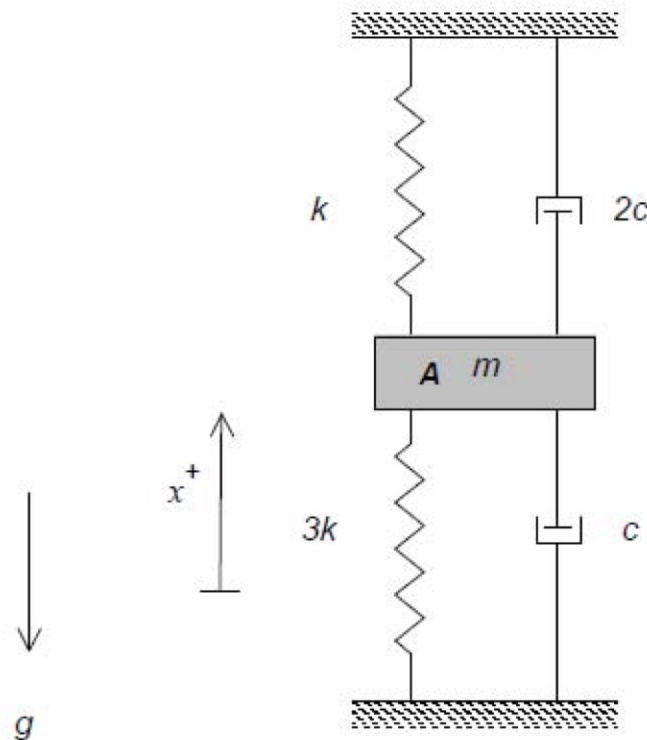


Homework H.6.F

Given: Block A, having a mass of m , is supported by two springs and two dashpots, as shown below. Let x represent the motion of block A measured positively upward. When $x = 0$ m, the springs are unstretched.

Find: For this problem:

- Draw a free body diagram of block A;
- Derive an equation of motion for the system for the system in terms of the coordinate x , its time derivatives, and, at most, the following parameters: g , m , c , and k ; and
- Determine numerical values for the undamped natural frequency ω_n , the damping ratio ζ , and the damped natural frequency ω_d .



VERTICAL PLANE

Use the following parameters in your analysis: $m = 32$ kg, $k = 1800$ N/m, and $c = 120$ kg/s.