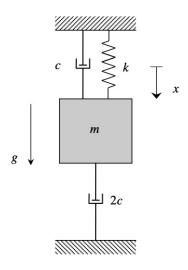
Homework 6.F

Given: A block of mass m is attached to a grounded spring (of stiffness k) and two dashpots (having damping coefficients c and 2c), as shown in the figure. Let x represent the motion of the block, with x = 0 when the spring is unstretched.

Find: For this problem:

- (a) Derive the dynamical equation of motion (EOM) of the system in terms of the coordinate x;
- (b) Determine the static equilibrium position of the block, x_{st} ;
- (c) Rewrite the EOM of the system in terms of the variable $z = x x_{st}$, where z represents the position of the block relative to its static equilibrium position; and,
- (d) Determine undamped natural frequency ω_n , the damping ratio ζ and the damped natural frequency ω_d for the system in terms of, at most, the parameters of the problem: m, c and k.



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