**Homework H.6.L**

Given: Block C, having a mass of m, is attached to a moveable base B by two springs, as shown in the figure below. Base B is given a prescribed horizontal motion of $x_B(t) = b \sin \omega t$. Let x represent the motion of C (measured positively to the right), and let the springs be unstretched when $x = x_B = 0$ m.

Find: For this problem:
(a) Draw a free body diagram of block C;
(b) Derive the differential equation of motion for the system in terms of the coordinate x;
(c) Derive the particular solution $x_p(t) = A \sin \omega t$ for the previously-obtained equation of motion;
(d) Make a plot of the amplitude of x_p (i.e. $|A|$) versus the excitation frequency ω; and
(e) Determine the two positive values of the excitation frequency ω for which the amplitude of x_p is exactly twice the amplitude of the base motion (that is, when $|A| = 2b$).
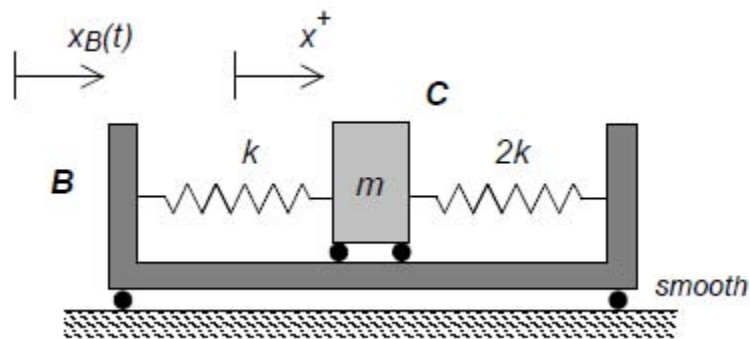
Use the following parameters in your analysis: $m = 36$ kg, $k = 5808$ N/m, and $b = 0.02$ m.