Spring system #1

A 1/8-kg mass is attached to a spring with stiffness k=16 N/m. The mass is pulled 1/2 m down of the equilibrium point and given a downward velocity of $\sqrt{2}$ m/sec. Neglecting any damping or external force that may be present, determine the equation of motion of the mass.

How long after release does the mass pass through the equilibrium position?

Spring system #2

A 1/4-kg mass is attached to a spring with stiffness 4 N/m. The damping constant for the system is 1 N-sec/m. If the mass is pushed upwards by 1/2 m and given an initial upwards velocity of 1m/sec, find the equation of motion.

What will be the maximum displacement that the mass will attain?

Spring system #3

What happens if resonance is not taken into account…

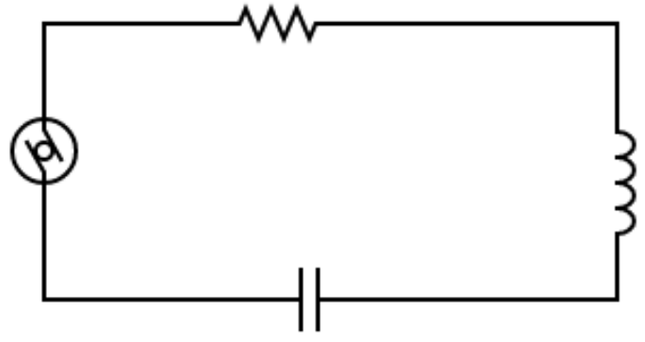
https://www.youtube.com/watch?v=XggxeuFDaDU&list=WL&index=23

Spring system #4

A 1-kg mass is attached to a spring with stiffness 49 N/m. At time t=0 an external force $F(t) = 20\cos(4t)$ N is applied. The damping constant for the system is 6 N-sec/m. Determine the solution and identify the transient and steady-state terms.

Electric system #1

The RLC circuit in the figure below has a voltage source given by E(t) = sin(100t) V, a resistor of 0.02 Ω, an inductor of 0.001 H and a capacity of 2 F.
If the initial current and the initial charge on the capacitor are both zero, determine the current in the circuit for t>0.



Electric system #2

Consider the RLC circuit in the figure below. At time t=0, the charge in the capacitor is 2C, while the current through the capacitor is zero.
Determine the charge on the capacitor and all the currents in the various branches of the circuit at any time t>0.