EE341.01 **PS7** **DUE: F 10/31/97**

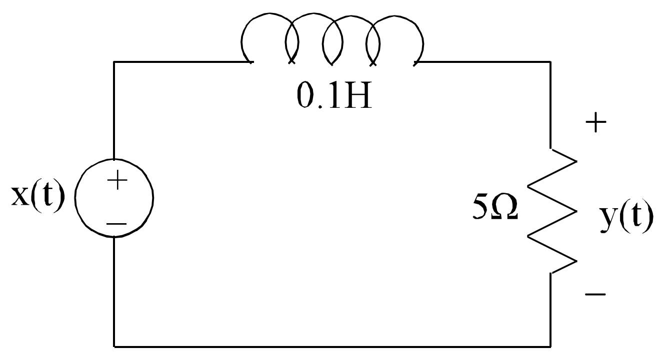
Please turn in your matlab m-files when used.

1. Problem 5.1

2. Problem 5.3: If x(t) is periodic, its amplitude and phase spectra are typically plotted as $|c_n|$ and $\angle c_n$ versus frequency, respectively. If x(t) is aperiodic, its amplitude and phase spectra are plotted as $|X(w)|$ and $\angle X(w)$ versus frequency, respectively.

3. Problem 5.4

4. Consider the following electrical circuit consisting of a time-varying voltage source x(t), inductor, resistor, and output voltage y(t).



a) Find the differential equation relating only x(t) and y(t).

b) Find the frequency function $H(\omega)$ (the FT of the impulse response) from the differential equation found in (a).

c) Plot the magnitude and phase of $H(\omega)$ versus frequency.

d) Given $x(t) = 3 + \cos(10t) + \cos(1000t) + \cos(100000t)$, find y(t).

e) Plot x(t) and y(t). Make sure to use a small enough time range to get a good view of the signals.

f) Examine your answers to parts (c), (d), and (e) and comment on what this circuit is doing to the input signal.