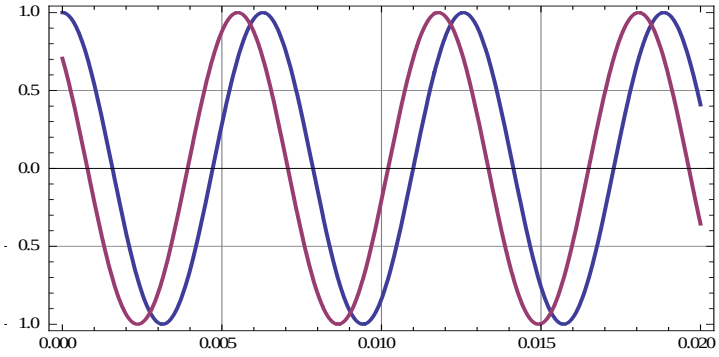
Physics 112
Exp.#9: Impedance and Reactance
Preliminary Laboratory Questions

1) Consider a series RLC circuit with a sinusoidal input: $\varepsilon(t) = 2\cos(5x10^3 t)\, Volts$. If R=1KΩ, L= 5 mH and C=0.2 μF.
a) Find the equivalent impedance of the circuit.

b) Write down an expression for the current in the circuit

2) The plot below shows two sinusoidal wave phase shifted. Estimate the value of this phase shift.



3) Suppose that the frequency of the input voltage from a signal generator is 20 KHz.
a) Calculate the phase shift between the current in the circuit and the input voltage in an RLC-series circuit with R=1 KΩ, L=10 mH and C=0.1 μF.

b) Find the frequency when this phase shift will be zero.

c) Calculate the current in the circuit in this case (when phase shift is zero).