ECE 311 - Homework #3

Phasors (review)

1) Find Y as a complex number

$$Y = \left(\frac{50s+3}{(s+2)(s+5)} \right)_{s=-1+j2}$$

2) Find Y as a compex number

$$Y = \left(\frac{200}{s^3+6s^2+8s+50} \right)_{s=-3+j4}$$

3) Express y(t) in phasor form

a) $y(t) = 3\cos(10t) + 7\sin(10t)$

b) $y(t) = -2\cos(50t) + 200\sin(50t)$

c) $y(t) = 20\sin(30t)$

4) Determine the phasor impedance of the following

a)   10mH inductor operating at 100Hz

b)   10mH inductor operating at 1000 Hz

c)   0.1uF capacitor operating at 100Hz

d)   0.1uF capacitor operating at 1000Hz

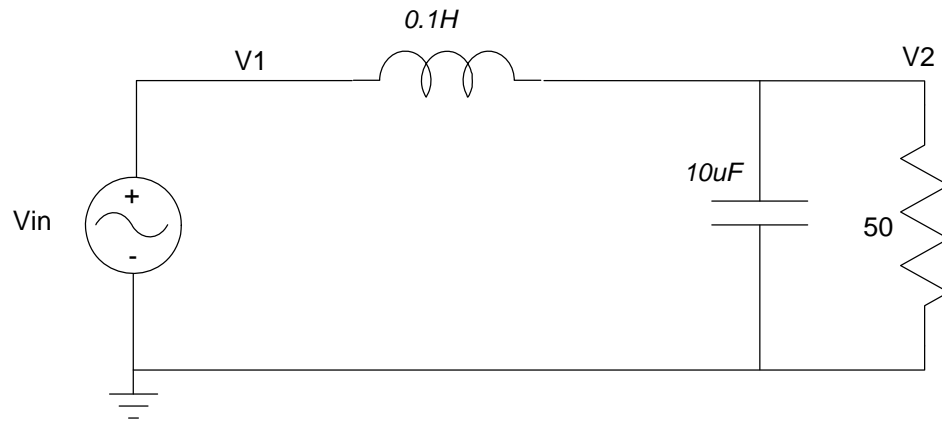5) Assume Vin contains a DC and 16Hz (100 rad/sec) signal:

$$V_{in} = 10 + 3\sin(100t)$$

- a) Determine the impedances of the inductor, capacitor, and resistor at DC and 100 rad/sec
- b) Determine the voltage, V2, using phasor analysis
- c) Check your answer using PartSim (or similar program)

6) Assume Vin contains a DC and 160Hz signal:

$$V_{in} = 5 + 3\sin(1000t)$$

- a) Determine the impedances of the inductor, capacitor, and resistor at DC and 1000 rad/sec
- b) Determine the voltage, V2, using phasor analysis

Problem 5 & 6: