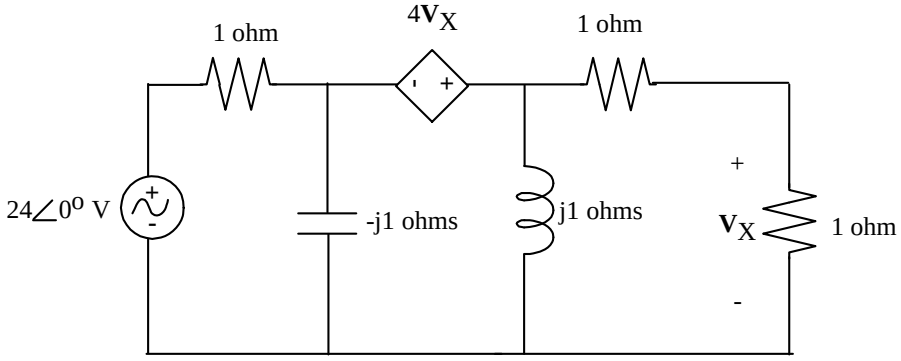
EE 313 - Extra Credit II
Fall 2010
You must show your work to receive credit

1. [2 points] Consider the following circuit:



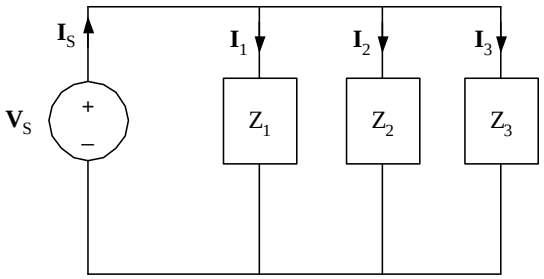
What is the total complex power delivered by each source?

24∠0° delivers _____ $4V_X$ delivers _____

What is the real power absorbed by the left-most 1 ohm resistor and the j1 ohm inductor?

1 ohm absorbs _____ j1 ohm absorbs _____

2. [3 points] Consider the following single phase circuit:



Load 1 – 10kVA at PF=.6 lagging
Load 2 – 10kW at PF = 1
Load 3 – -6kVAR at PF=.2 leading

a) Find the total complex power delivered by the source. S_S = _____
b) What is the source current magnitude? I_S = _____
c) Can the source current magnitude be reduced by 50% (circle) yes or no
without changing the real power delivered or the source
voltage magnitude? What will the power factor of the source be? PF_S _____

3. [3 points] You are given a balanced three phase Y-connected source where V_{an} = 208∠0° V rms. It is connected to two balanced three phase loads:

Load 1: 3 kVA at PF=.7 lagging
Load 2: 2 kVA at PF=0.75 leading

What are the values of the loads in the delta configuration?

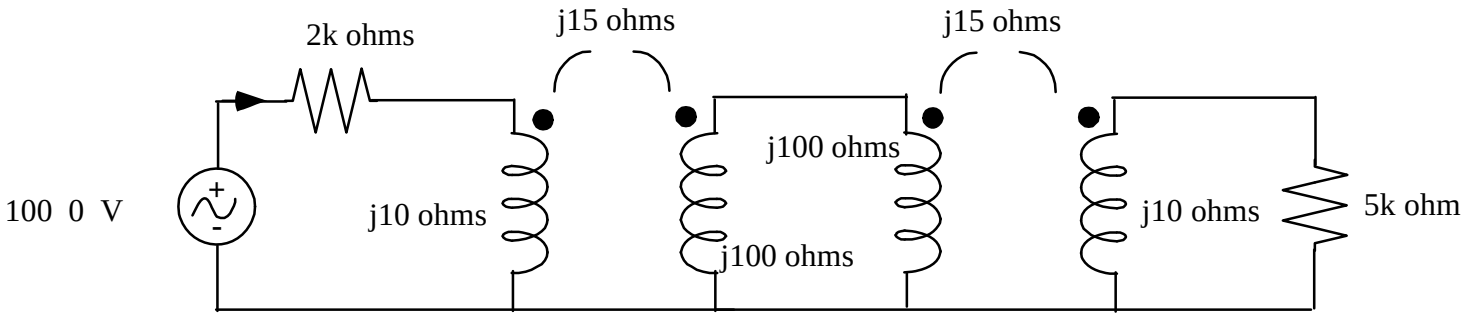
$Z_{\Delta 1}$_____ $Z_{\Delta 2}$_____

What is the magnitude of the line current? I_L_____

If a third load is added to correct the power factor to PF=.8 lagging, will the load be capacitive or inductive?

(circle one) inductive or capacitive

4. [2 points] Consider the following circuit:



What is the power absorbed by the 5 k ohm resistor? P=_____

Suppose the transformer pairs were removed from the circuit and the 5 k ohm resistor connected directly to the source (i.e. voltage source and 2k ohm source resistance). What is the power absorbed by the 5k ohm resistor? P=_____

Explain why this occurs?