ELEC 226, Spring 2012
Prof. Rich Kozick

Homework 5 Answers

Please be sure to clearly show your work in the solutions that you submit. Your approach is much more important than obtaining the correct numerical answer.

Problem 8.12: $\boldsymbol{S}_{R1}$ =2.55 VA (purely real); $\boldsymbol{S}_L = j2.95$ VA; $\boldsymbol{S}_C = -j0.92$ VA;
$\boldsymbol{S}_{R2}$ = 0.64 VA (purely real); $\boldsymbol{S}_{Vs} = -1.54 - j1.65$ VA; $\boldsymbol{S}_{Is} = -1.65 - j0.38$ VA

Hint: You might want to solve for the unknown node voltages using nodal analysis first, and then find the complex power for each component.

Problem 8.21: a. $\mathbf{V}_{S,\text{rms}} = 407 \angle 31.8°$ Vrms
b. $\boldsymbol{Z}_1 = 1.08 + j0.81$ kΩ; $\boldsymbol{Z}_2 = 1.57 - j1.60$ kΩ; $\boldsymbol{Z}_3 = 2.02 - j2.69$ kΩ;

Hint: a) "Applying the law of conservation of energy" means to solve the problem by finding the total complex power of the load. That is, do not find the impedances of the load and apply Ohm's law to find the voltage. You should not find any impedances to solve part a. Wait until part b to do that.