

ECE 209 — Final Exam

Estimated time for completion: <120 minutes
6 May 2015

Rules of the Exam

Rule 1: The examination period begins at 1:30pm on Wednesday 6 May 2015 and ends at 3:30pm on Wednesday 6 May 2015.

Rule 2: There are three problems. Each problem has equal weight.

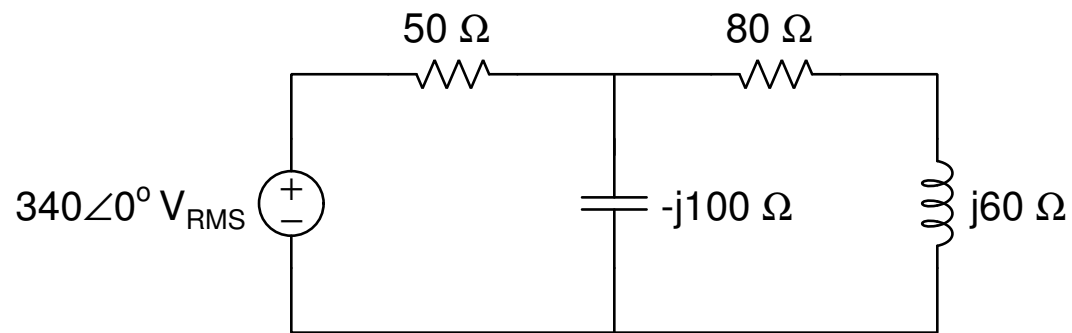
Rule 3: Show all work and state all assumptions. Make sure to include the units along with a numerical answer.

Rule 4: The exam is closed book and closed notes. You may have an 8.5" x 11" sheet of paper with notes. You may use a calculator.

Name

Problem 1 Real and Reactive Power

Consider the circuit below:



What is the average real power associated with the voltage source? _____

What is the reactive power associated with the voltage source? _____

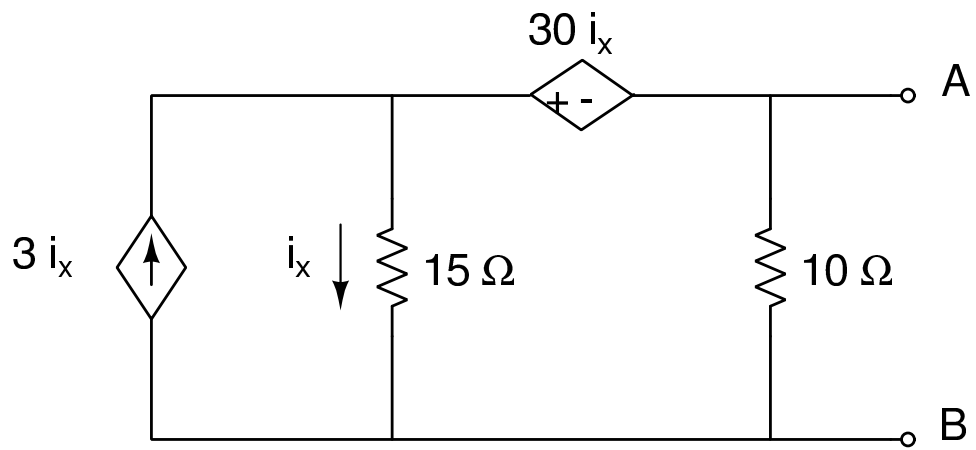
Does the voltage source deliver or absorb average real power? _____

What is the average real power associated with the 80Ω resistor? _____

What is the average real power associated with the $j60\Omega$ inductor? _____

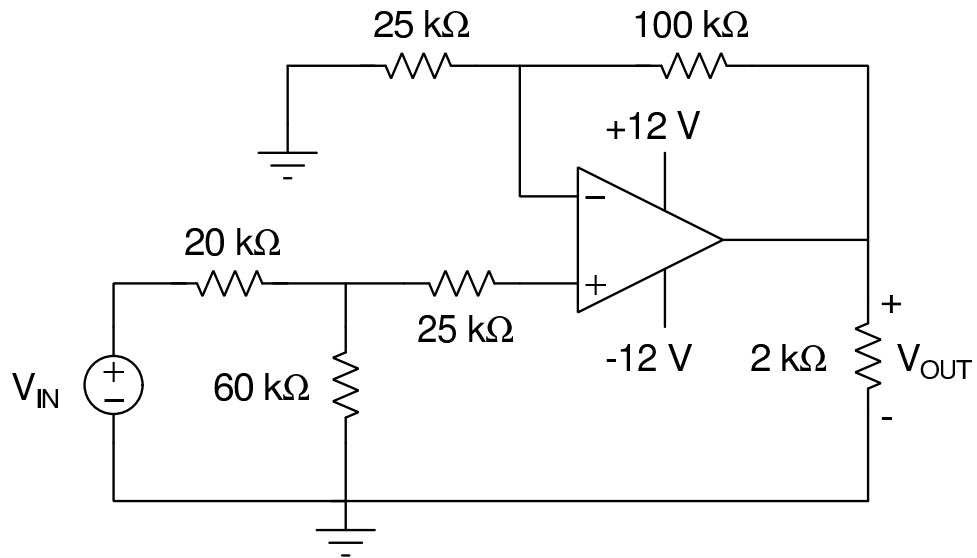
Problem 2 Thévenin Equivalent Circuit

Draw the Thévenin Equivalent Circuit with respect to terminals A and B for the circuit below:



Problem 3 Ideal Op Amp

Consider the ideal Op Amp circuit below:



Part A: Derive an expression relating V_{OUT} as a function of V_{IN} : _____

Part B: Complete the table below:

V_{IN}	V_{OUT}
-4 V	
-2 V	
0 V	
2 V	
4 V	