

Homework Assignment #3

Due: Monday, Feb. 6

*Chapter 8*

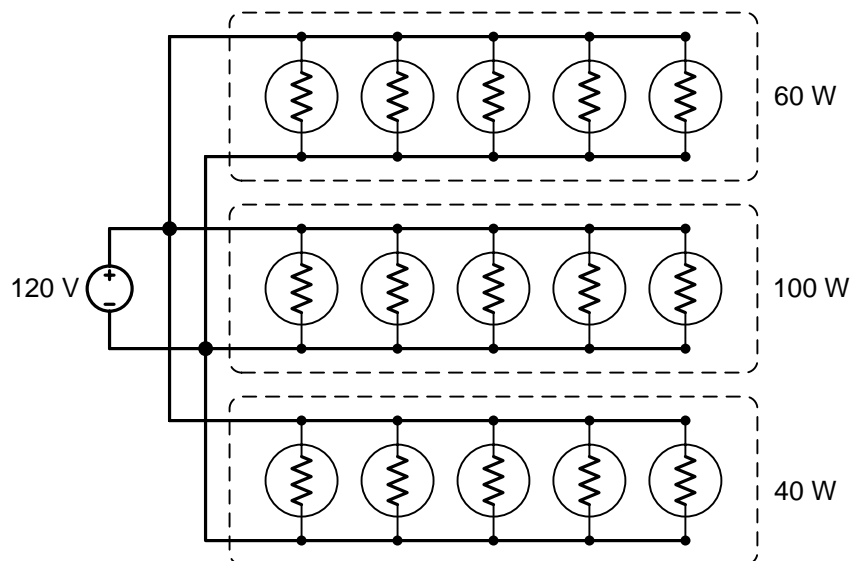
Problems: 1, 4, 5a, 6a, 7a, 8, 9, 16, 19, 34, 35

Points: (3), (4), (3), (3), (4), (3), (3), (4), (4), (3), (3)

## HC.3 (6 points)

The following schematic is an abstract representation of a circuit formed by 15 incandescent light bulbs in a house. The 120 V source represents the utility company's power lines into the house. In this schematic, there are five 60-W bulbs, five 100-W bulbs, and five 40-W bulbs. For this schematic, do the following:

- Identify all nodes in the circuit.
- What is the voltage across each light bulb?
- What is the current through each light bulb?
- Find  $I_S$ , the current supplied by the utility company.



## HH.1 (10 points)

(a) Convert the following complex numbers to polar form. Plot them as vectors in the complex plane.

- $j$
- $-j$
- $-1$
- $-1 - j$

(b) Convert the following complex numbers to rectangular form. Plot them as vectors in the complex plane.

- $5 \angle 180^\circ$
- $4 \angle 30^\circ$
- $2 \angle -40^\circ$
- $5 \angle 90^\circ$