- Homework is due at the beginning of class
- Start early and get help if you need it
- Show all work neatly and clearly; redraw and/or rewrite problem if needed as work turned in should stand alone
- Identify your answers (with units) using a box, circle or underline
- Staple multiple pages together

1. Consider the circuit shown below with currents, node-voltages, and a reference labeled.
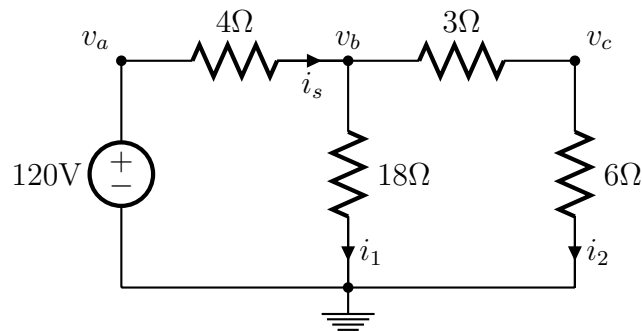
(a) Use series and parallel simplifications to find the currents i_s, i_1, and i_2 as labeled.

(b) Calculate the power consumed by all elements (denote as $p_{120\text{V}}$, $p_{4\Omega}$, $p_{18\Omega}$, $p_{3\Omega}$, $p_{6\Omega}$) in the circuit and confirm they sum to zero.

(c) Determine the node-voltages v_a, v_b, and v_c as labeled.

(d) Show how an ammeter should be connected to measure the current i_1.

(e) Show how an ohmmeter should be connected to measure the equivalent resistance connected to the voltage source.

2. Consider the circuit shown below with voltages, node-voltages and a reference labeled.
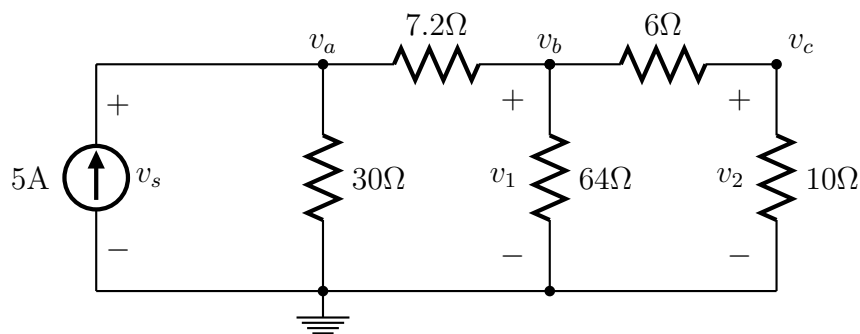
(a) Use series and parallel simplifications to find the voltages v_s, v_1, and v_2 as labeled.

(b) Calculate the power consumed by all elements (denote as $p_{5\text{A}}$, $p_{30\Omega}$, $p_{7.2\Omega}$, $p_{64\Omega}$, $p_{6\Omega}$, $p_{10\Omega}$) in the circuit and confirm they sum to zero.

(c) Determine the node-voltages v_a, v_b, and v_c as labeled.

(d) Show how a voltmeter should be connected to measure the voltage v_1.

(e) Show how an ohmmeter should be connected to measure the resistance of only the 64Ω resistor.

3. The circuit shown below contains a 24V source and three lamps. The lamps are denoted by A, B, and C, and are rated to consume $p_A = 10\text{W}$, $p_B = 15\text{W}$, and $p_C = 20\text{W}$ of power, respectively. If the voltage source consumes -30W of power, which lamp has burned out?