Name_____

Phys 2020 (NSCC), Spring 2006
Problem Set #3

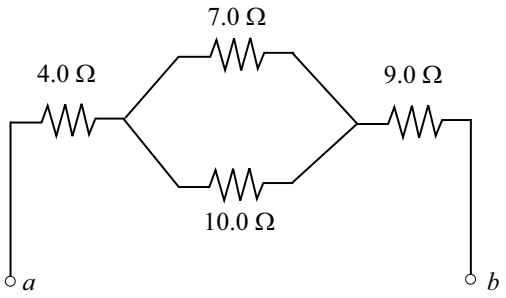
1. A lightbulb has a resistance of $240\,\Omega$ when operating at a voltage of 120 V. What is the current in the bulb?

2. Calculate the cross-sectional area of a 2.0-cm length of tungsten filament in a small lightbulb if its resistance is $0.050\,\Omega$. Then find the radius of the wire. The resistivity of tungsten is $5.6 \times 10^{-8}\,\Omega \cdot \mathrm{m}$.

3. A toaster is rated at 600 W when connected to a 120-V source. What current does the toaster carry and what is its resistance?

4. A 4.0 Ω resistor, 8.0 Ω resistor, and a 12.0 Ω resistor, are connected in parallel across a 24.0-V battery. Find (a) the equivalent resistance of the combination and (b) the total current in the circuit.

5. For the combination of resistors shown at the right, find the equivalent resistance between points a and b.



6. Suppose a potential difference of 34.0 V is connected across a and b in Problem 5. Find the potential drops across the 4.00 Ω and 9.00 Ω resistors.

7. Continuing with Problem 6, find the currents in the $7.00\,\Omega$ and $10.0\,\Omega$ resistors.

8. Continuing with the same circuit, find the power dissipated in each of the four resistors.