SP 212 Worksheet
Lesson 14: Ch. 26.4-26.5, Ohm’s Law & Power

1) Wires C and D have equal lengths $L_C = L_D = 1.0$ m. Wire C has resistivity $\rho_C = 2.0 \times 10^{-6}$ Ωm, wire D has resistivity $\rho_D = 1.0 \times 10^{-6}$ Ωm. Wire C has diameter $d_C = 1.00$ mm, wire D has diameter 0.50 mm. Together, the wires support a 2.0 A current.

(a) What is the ratio of current densities, $J_D/J_C$?
(b) What is the electric potential difference between points 1 & 2?
(c) What is the electric potential difference between points 2 & 3?
(d) What is the rate at which energy is dissipated between points 1 & 2?
(e) What is the rate at which energy is dissipated between points 2 & 3?

2) A 1440 W heater is constructed to operate at 115 V (a) What is the current in the heater when the unit is operating? (b) What is the resistance of the heating coil? (c) How much thermal energy is produced in 4.66 hours?