A heating element is made of a wire with a cross-sectional area $A = 2.60 \times 10^{-6} \text{m}^2$ and a resistivity $\rho = 5.00 \times 10^{-7} \Omega \text{m}$.

(a) If the element dissipates 5000W when operating at a voltage $V_1 = 75.0 \text{V}$, what is its length $L_1$, its resistance $R_1$, and the current $I_1$ running through it?

(b) What must be the voltage $V_2$, the resistance $R_2$, and the length $L_2$ of a heating element made of the same wire if the same power should be generated with half the current?