

51. We use Eq. 27-17: $\rho - \rho_0 = \rho\alpha(T - T_0)$, and solve for T :

$$T = T_0 + \frac{1}{\alpha} \left(\frac{\rho}{\rho_0} - 1 \right) = 20^\circ\text{C} + \frac{1}{4.3 \times 10^{-3}/\text{K}} \left(\frac{58\,\Omega}{50\,\Omega} - 1 \right) = 57^\circ\text{C} .$$

We are assuming that $\rho/\rho_0 = R/R_0$.