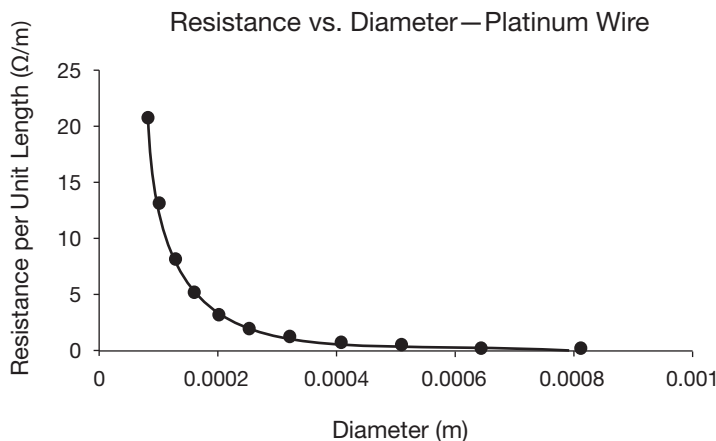


AP Physics 1 Review Questions

Integrating Content, Inquiry and Reasoning

1. A 30.4-gram sample of titanium metal is spun into a cylindrical wire of length, L , and cross-sectional radius, r . The density of titanium is 4.50 g/cm^3 and its resistivity is $4.20 \times 10^{-7} \Omega\cdot\text{m}$. Determine the values of L and r if the resistance of the wire is measured to be 1.87Ω .
2. A wire of length L has a measured resistance of 3.50Ω . The wire is then stretched to a new length five-times that of the original. The density and resistivity of the wire are unaffected. Find the resistance of the elongated wire.
3. Two wires made of the same material are drawn to be equal lengths. The resistance of the wires are measured with a multimeter to be 14Ω and 20Ω , respectively. The diameter of the first wire is 1.2 mm . What is the diameter of the second wire?
4. Data were collected for various gauges (thicknesses) of platinum wire. The data is summarized in the chart below. The equation for the regression is: $y = (1.34 \times 10^{-7})x^{-2}$.



- a. Based on the results above, explain why the regression is proportional to x^{-2} or $\frac{1}{x^2}$.
- b. Can the resistivity of platinum be determined from the data and regression? Explain.