## **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<sup>3</sup> and its resistivity is  $4.20 \times 10^{-7} \Omega \cdot m$ . Determine the values of *L* and *r* if the resistance of the wire is measured to be 1.87  $\Omega$ .
- 2. A wire of length *L* has a measured resistance of  $3.50 \Omega$ . 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 14  $\Omega$  and 20  $\Omega$ , 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.

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