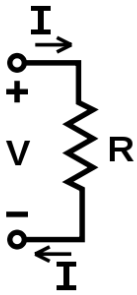
Answer on Question #44113, Physics, Electric circuits

A light bulb is connected to a 260V potential, and produces 120-Watts of light and heat. What is the resistance of the wire in the light bulb?

**Solution**.




From the Ohm's law:

$$I = \frac{V}{R}$$

Electric power that is dissipated by a bulb can be written as follows:

$$P = V \cdot I = \frac{V^2}{R}$$

So:

$$R = \frac{V^2}{P}$$

Numerically:

$$R = \frac{(260V)^2}{120W} \approx 563\ Ohm$$

**Answer:** $R \approx 563\ Ohm$