What should be the length of nichrome wire of resistance 4.5 ohms if the length of similar wire is 60 cm and resistance 2,5 ohms?

The resistance of a given object depends primarily on two factors: What material it is made of, and its shape. For a given material, the resistance is inversely proportional to the cross-sectional area. Also, for a given material, the resistance is proportional to the length. The resistance R of a conductor of uniform cross section, therefore, can be computed as

$$R = \frac{\rho l}{A}$$

where l is the length of the conductor, measured in metres [m], A is the cross-section area of the conductor measured in square metres [m²], and ρ (rho) is the electrical resistivity (also called specific electrical resistance) of the material, measured in ohm-metres (Ω·m).

Therefore:

$$R_1 = \frac{\rho l_1}{A}$$

$$R_2 = \frac{\rho l_2}{A}$$

Or:

$$\frac{R_2}{R_1} = \frac{l_2}{l_1}$$

Finally:

$$l_2 = \frac{l_1 R_2}{R_1} = 60 \ cm * \frac{4.5}{2.5} = 108 \ cm$$

Answer: $108 \ cm$