

2.

$l_1 = 56 \text{ m}$

$R = \frac{l}{\gamma * A}$

$l_2 = 112 \text{ m}$

$\underline{R_1 = 1 \Omega}$

$R_1 = 1 \Omega$

$\underline{R_2 = 2 \Omega}$

$R_2 = 2 \Omega$

Bei doppelter Länge ist der Widerstand doppelt so groß.

3.

$A_1 = 1 \text{ mm}^2$

$R = \frac{l}{\gamma * A}$

$A_2 = 2 \text{ mm}^2$

$\underline{R_1 = 1 \Omega}$

$R_1 = 1 \Omega$

$\underline{R_2 = 0,5 \Omega}$

$R_2 = 0,5 \Omega$

Bei doppeltem Querschnitt ist der Widerstand halb so groß.

4.

$l = 3,2 \text{ km} \rightarrow 3200 \text{ m}$

$R = \frac{l}{\gamma * A}$

$A = 25 \text{ mm}^2$

$\underline{R = 3,657 \Omega}$

$\underline{\gamma = 35}$

$R = 3,657 \Omega$

5.

$R = 32 \Omega$

$A = \frac{d^2 * \pi}{4}$

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

$d = 0,8 \text{ mm}$

$\underline{A = 0,5 \text{ mm}^2}$

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

$\underline{\rho = 0,6}$

$\underline{l = 26,67 \text{ m}}$

$l = 26,67 \text{ m}$

6.

$\gamma = 35$

$R = \frac{l}{\gamma * A}$

$l = 1200 \text{ m}$

$A = \frac{l}{R * \gamma}$

$\underline{R = 1,75 \Omega}$

$\underline{A = 19,59 \text{ mm}^2}$

$A = 20 \text{ mm}^2$

20 mm² Normquerschnitt

7.

$\gamma = 56$

$R = \frac{l}{\gamma * A}$

$l = R * \gamma * A$

$d = 0,4 \text{ mm}$

$A = \frac{d^2 * \pi}{4}$

$l = \underline{\underline{35,28 \text{ m}}}$

$R = \underline{5 \Omega}$

$A = \underline{0,126 \text{ mm}^2}$

$l = 35,28 \text{ m}$

8.

$A = 2,5 \text{ mm}^2$

$R = \frac{l}{\gamma * A}$

$\gamma = 56$

$R = \underline{\underline{0,357 \Omega}}$

$l = \underline{50 \text{ m}}$

$R = 0,357 \Omega$

9.

$\rho = 1$

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

$d = \sqrt{\frac{4 * A}{\pi}}$

$R = 20 \Omega$

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

$d = \underline{\underline{0,87 \text{ mm}}}$

$l = \underline{12 \text{ m}}$

$A = \underline{0,6 \text{ mm}^2}$

$d = 0,87 \text{ mm}$

10.

$U = 220 \text{ V}$

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

$A = \frac{d^2 * \pi}{4}$

$I = 9,5 \text{ A}$

$R = \underline{\underline{23,16 \Omega}}$

$A = \underline{0,125 \text{ mm}^2}$

$\rho = 1,1$

$R = \frac{l}{\gamma * A}$

$d = \underline{0,4 \text{ mm}}$

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

$l = 2,63 \text{ m}$

$l = \underline{\underline{2,63 \text{ m}}}$

11.

$\rho = 0,9$

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

$A = \frac{d^2 \cdot \pi}{4}$

$d = 0,6 \text{ mm}$

$R = \underline{48,21 \Omega}$

$A = \underline{0,28 \text{ mm}^2}$

$l = 15 \text{ m}$

$U = R \cdot I$

$I = \underline{1,8 \text{ A}}$

$U = \underline{86,778 \text{ V}}$

$U = 86,78 \text{ V}$

$R_{50} = \frac{U}{I}$

$R_{50} = 27,78 \Omega$

$R_{50} = \underline{\underline{27,78 \Omega}}$

12.

$\gamma = 56$

$l = n \cdot l$

$n = 520$

$l = \underline{83,2 \text{ m}}$

$l = 16 \text{ cm}$

$A = \frac{d^2 \cdot \pi}{4}$

$d = 0,3 \text{ mm}$

$A = \underline{0,07 \text{ mm}^2}$

$I = \underline{0,4 \text{ A}}$

$R = \frac{1}{\gamma \cdot A}$

$U = R \cdot I$

$U = 8,49 \text{ V}$

$R = \underline{21,22 \Omega}$

$U = \underline{\underline{8,488 \text{ V}}}$

13.

$A = 1 \text{ mm}^2$

$R = \frac{1}{\gamma \cdot A}$

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

$U = 5 \text{ V}$

$l = R \cdot \gamma \cdot A$

$R = \underline{1,79 \Omega}$

$\gamma = \underline{56}$

$l = \underline{100 \text{ m}}$

$l = 100 \text{ m}$