1.

$R_1 = 120 \ \Omega$ $\qquad\qquad$ $R_G = \dfrac{R_1 \times R_2}{R_1 + R_2}$

$\underline{R_2 = 120 \ \Omega}$ $\qquad\qquad$ $\underline{R_G = 60 \ \Omega}$

$R_G = 60 \ \Omega$

2.

$R_1 = 48 \ \Omega$ $\qquad\qquad$ $I = \dfrac{U}{R}$

$R_2 = 65 \ \Omega$ $\qquad\qquad$ $\underline{I_1 = 4{,}79 \ A}$

$R_3 = 28 \ \Omega$ $\qquad\qquad$ $\underline{I_2 = 3{,}54 \ A}$

$\underline{U = 230 \ V}$ $\qquad\qquad$ $\underline{I_3 = 8{,}21 \ A}$

$I_1 = 4{,}79 \ A$

$I_2 = 3{,}54 \ A$

$I_3 = 8{,}21 \ A$

3.

$U = 230 \ V$ $\qquad$ $R_1 = \dfrac{U}{I_1}$ $\qquad$ $I_2 = I_G - I_1$

$I_g = 10{,}4 \ A$ $\qquad$ $\underline{R_1 = 63{,}89 \ \Omega}$ $\qquad$ $\underline{I_2 = 6{,}8 \ A}$

$\underline{I_1 = 3{,}6 \ A}$ $\qquad$ $R_2 = \dfrac{U}{I_2}$

$R_1 = 63{,}89 \ \Omega$ $\qquad$ $\underline{R_2 = 33{,}82 \ \Omega}$

$R_2 = 33{,}82 \ \Omega$

$I_2 = 6{,}8 \ A$

4.

$U = 230 \ V$ $\qquad$ $I_g = I_1 + I_2$

$I_1 = 13{,}6 \ A$ $\qquad$ $\underline{I_g = 22{,}6 \ A}$

$\underline{I_2 = 9 \ A}$ $\qquad$ $R_1 = \dfrac{U}{I_1}$ $\qquad$ $R_2 = \dfrac{U}{I_2}$

$I_g = 22{,}6 \ A$ $\qquad$ $\underline{R_1 = 16{,}91 \ \Omega}$ $\qquad$ $\underline{R_2 = 25{,}56 \ \Omega}$

$R_1 = 16{,}91 \ \Omega$

$R_2 = 25{,}56 \ \Omega$

5.

$R_1 = 230\ \Omega$

$I_1 = \dfrac{U}{R_1}$

$I_2 = \dfrac{U}{R_2}$

$R_2 = 115\ \Omega$

$\underline{I_1 = 1\ A}$

$\underline{I_2 = 2\ A}$

$\underline{U = 230\ V}$

$R_G = \dfrac{U}{I_G}$

$R_g = 76{,}67\ \Omega$

$\underline{R_G = 76{,}67\ \Omega}$

$I_1 = 1\ A$

$I_2 = 2\ A$

6.

$U = 230\ V$

$R_G = \dfrac{U}{I_G}$

$I_2 = I_G - I_1$

$I_G = 0{,}64\ A$

$\underline{R_G = 359{,}38\ \Omega}$

$\underline{I_2 = 0{,}29\ A}$

$\underline{I_1 = 0{,}35\ A}$

$R_1 = \dfrac{U}{I_1}$

$R_2 = \dfrac{U}{I_2}$

$R_g = 359{,}38\ \Omega$

$\underline{R1 = 657{,}14\ \Omega}$

$\underline{R2 = 793{,}10\ \Omega}$

$R1 = 657{,}14\ \Omega$

$R2 = 793{,}10\ \Omega$

7.

$U = 12\ V$

$R_3 = \dfrac{U}{I_3}$

$I_1 = \dfrac{U}{R_1}$

$I_G = 3{,}5\ A$

$\underline{R_3 = 6\ \Omega}$

$\underline{I_1 = 1\ A}$

$I_3 = 2\ A$

$R_2 = \dfrac{U}{I_2}$

$I_2 = I_G - I_1 - I_3$

$\underline{R_1 = 12\ \Omega}$

$\underline{R_2 = 24\ \Omega}$

$\underline{I_2 = 0{,}5\ A}$

$R_2 = 24\ \Omega$

$R_G = \dfrac{U}{I_G}$

$R_3 = 6\ \Omega$

$\underline{R_G = 3{,}43\ \Omega}$

$R_G = 3{,}43\ \Omega$

8.

U = 24 V

$I_3 = \frac{U}{R_3}$

$I_4 = \frac{U}{R_4}$

I₁ = 1,8 A

$\underline{I_3 = 0,4\ A}$

$\underline{I_4 = 0,2\ A}$

I₂ = 0,6 A

$I_G = I_1 + I_2 + I_3 + I_4$

R₃ = 60 Ω

$\underline{I_G = 3\ A}$

$\underline{R_4 = 120\ \Omega}$

$R_1 = \frac{U}{I_1}$

$R_2 = \frac{U}{I_2}$

I_G = 3 A

$\underline{R_1 = 13,33\ \Omega}$

$\underline{R_2 = 40\ \Omega}$

R_G = 8 Ω

$R_G = \frac{U}{I_G}$

$\underline{R_G = 8\ \Omega}$

9.

A = 1,5 mm²

$R_1 = \frac{l}{\gamma * A}$

l = 75 m

$\underline{R_1 = 0,89\ \Omega}$

γ = 56

$R_G = \frac{R_1}{3}$

3 Leiter

$\underline{R_G = 0,3\ \Omega}$

R_G = 0,3 Ω

10.

U = 230 V

$R_G = \frac{U}{I_G}$

I_G = 9,5 A

$\underline{R_G = 24,21\ \Omega}$

weil 2 gleich große

R_G = 24,21 Ω

$R_1 = R_G \times 2$

Widerstände

R₁ = 48,42 Ω

$\underline{R_1 = 48,42\ \Omega}$

I₁ = 4,75 A

$I_1 = \frac{U}{R_1}$

$\underline{I_1 = 4,75\ A}$

11.

$I_1 = 6{,}5$ A

$U = 230$ V

$I_G = 10$ A

$d = 0{,}45$ mm

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

$l = \textcolor{red}{6{,}27 \text{ m}}$

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

$\underline{A = 0{,}16 \text{ mm}^2}$

$R_G = \frac{U}{I_G}$

$\underline{R_G = 23 \ \Omega}$

$R_2 = \frac{l}{\gamma * A}$

$l = R_2 \times \gamma \times A$

$\underline{l = 6{,}27 \text{ m}}$

(6,31 m; mit genauen Zahlen)

$R_1 = \frac{U}{I_1}$

$\underline{R_1 = 35{,}38 \ \Omega}$

$R_2 = \frac{U}{I_2}$

$\underline{R_2 = 65{,}71 \ \Omega}$

$I_2 = I_G - I_1$

$\underline{I_2 = 3{,}5 \text{ A}}$

12.

$U = 230$ V

$R_1 = 40 \ \Omega$

$\underline{R_2 = 80 \ \Omega}$

Reihenschaltung:

$R_G = R_1 + R_2$

$\underline{R_G = 120 \ \Omega}$

Parallelschaltung:

$R_G = \frac{R_1 \times R_2}{R_1 + R_2}$

$\underline{R_G = 26{,}67 \ \Omega}$

$I_G = \frac{U}{R_G}$

$\underline{I_G = 1{,}92 \text{ A}}$

$I_G = \frac{U}{R_G}$

$\underline{I_G = 8{,}625 \text{ A}}$

Einzeln:

$I_1 = \frac{U}{R_1}$

$\underline{I_1 = 5{,}75 \text{ A}}$

$I_2 = \frac{U}{R_2}$

$\underline{I_2 = 2{,}875 \text{ A}}$