

# Lösungen

1

```
Remove["Global`*"]
```

```
U = 230 Volt; J = 2 A;
```

```
Rtotal = (U / J) /. {Volt / A → Ohm}
```

```
115 Ohm
```

```
R[R1_, R2_, R3_, R4_, R5_] := 1 / (1 / (R1 + R2 + R3) + 1 / R4 + 1 / R5); R[R1, R2, R3, R4, R5]
```

$$\frac{1}{\frac{1}{R1+R2+R3} + \frac{1}{R4} + \frac{1}{R5}}$$

```
R[R1, R2, R3, R4, R5] // Together
```

$$\frac{(R1 + R2 + R3) R4 R5}{R1 R4 + R2 R4 + R3 R4 + R1 R5 + R2 R5 + R3 R5 + R4 R5}$$

## Links

```
Solve[Rtotal == R[20 Ohm, 30 Ohm, R3, 50 Ohm, 60 Ohm], {R3}] // Flatten
```

$$\{R3 \rightarrow -\frac{16550 \text{ Ohm}}{193}\}$$

```
% // N
```

$$\{R3 \rightarrow -85.7513 \text{ Ohm}\}$$

**Negativer Widerstand: Schaltung so nicht möglich!**

## Rechts

```
Solve[Rtotal == R[30 Ohm, 20 Ohm, 10 Ohm, 60 Ohm, R5], {R5}] // Flatten
```

$$\{R5 \rightarrow -\frac{690 \text{ Ohm}}{17}\}$$

```
% // N
```

$$\{R5 \rightarrow -40.5882 \text{ Ohm}\}$$

**Negativer Widerstand: Schaltung so nicht möglich!**