1 Basic example

A light bulb is connected to a voltage supply with 12.2 V. The current through the light bulb is 54 mA. Calculate the power dissipated in the light bulb.

$$P = \Delta V \cdot I \tag{1}$$
$$= 12\,\mathrm{V} \times 54 \cdot 10^{-3}\,\mathrm{A} = 0.648\,\mathrm{W} \approx 0.65\,\mathrm{W} \tag{2}$$

2 Example with uncertainties

For a resistor, the voltage and current are measured to be $(4.32 \pm 0.01)\,\mathrm{V}$ and $(33.4 \pm 0.2)\,\mathrm{mA}$, respectively. Calculate the resistance with its uncertainty.

$$R = \frac{\Delta V}{I} \tag{3}$$
$$= \frac{4.32\,\mathrm{V}}{33.4 \cdot 10^{-3}\,\mathrm{A}} = 129.34\,\Omega \tag{4}$$

$$\Delta R = R_{\max} - R \tag{5}$$
$$= \frac{4.33\,\mathrm{V}}{33.2 \cdot 10^{-3}\,\mathrm{A}} - 129.34\,\Omega \tag{6}$$
$$= 130.42\,\Omega - 129.34\,\Omega = 1.1\,\Omega \tag{7}$$

$$R = (129.3 \pm 1.1)\,\Omega \tag{8}$$