The weighted mean.

- When the data have different errors, we need to use the weighted mean to estimate the mean value.
- This procedure requires you to assign a weight to each data point:

$$w_i = \frac{1}{\sigma_i^2}$$

- Note: when the error decreases the weight increases.
- The weighted mean and its error are defined as:

$$\bar{y} = \frac{\sum_{i=1}^{N} w_i y_i}{\sum_{i=1}^{N} w_i} \qquad \sigma_y^2 = \frac{1}{\sum_{i=1}^{N} w_i}$$