Error Propagation in Arithmetic Calculations courtesy of http://www.nuclear.utah.edu/

Type of Calculation	Example*	Standard Deviation of x
Addition or Subtraction	x = p + q - r	$s_x = \sqrt{s_p^2 + s_q^2 + s_r^2}$
Multiplication or Division	$x = \frac{p \cdot q}{r}$	$s_x = x \sqrt{\left(\frac{s_p}{p}\right)^2 + \left(\frac{s_q}{q}\right)^2 + \left(\frac{s_r}{r}\right)^2}$
Exponentiation	$x = p^{\gamma}$	$s_x = y \cdot x \frac{s_p}{p}$
Logarithm	$x = \log_{10} p$	$s_x = 0.434 \frac{s_p}{p}$
Natural Logarithm	$x = \ln p$	$s_x = \frac{s_p}{p}$
Antilogarithm	$x = anti \log_{10} p$	$s_x = 2.303 \cdot x \cdot s_p$
Natural Antilogarithm	$x = e^{p}$	$s_x = x \cdot s_p$

* p, q, and r are experimental variables whose standard deviations are s_p , s_q , and s_r , respectively: y is a constant.

Least Squares Error Analysis

With a set of data points, the error for a linear fit can be found following these equations: (x and y are the data points and N is the number of data points)

$$y = m \cdot x + b \qquad : \qquad \text{line equation} \\ \Delta = N \cdot \sum x^2 - (\sum x)^2 \qquad : \\ b = \frac{\sum x^2 \cdot \sum y - \sum x \cdot \sum xy}{\Delta} \qquad : \qquad \text{y-intercept} \\ m = \frac{N \cdot \sum xy - \sum x \cdot \sum y}{\Delta} \qquad : \qquad \text{slope} \\ \sigma_y = \sqrt{\frac{1}{N-2} \sum_{i=1}^{N} (y_i - b - mx_i)^2} \qquad : \qquad \text{standard deviation of the y's} \\ \sigma_b = \sigma_y \sqrt{\frac{\sum x^2}{\Delta}} \qquad : \qquad \text{standard deviation of the y-intercept} \\ \sigma_m = \sigma_y \sqrt{\frac{N}{\Delta}} \qquad : \qquad \text{standard deviation of the slope} \\ y = (m \pm \sigma_m) \cdot x + (b \pm \sigma_b) \qquad : \qquad \text{line equation with error} \end{cases}$$

This system of equations is what Microsoft Excel uses in its LINEST function.