

Propagation of Errors.
R. Corn - Chem M3LC.

Addition and Subtraction: sum of the squares of the absolute standard deviations:

$$y = a + b - c$$

$$s_y^2 = s_a^2 + s_b^2 + s_c^2$$

Multiplication and Division: sum of the squares of the relative standard deviations:

$$y = a b/c$$

$$\left(\frac{s_y}{y}\right)^2 = \left(\frac{s_a}{a}\right)^2 + \left(\frac{s_b}{b}\right)^2 + \left(\frac{s_c}{c}\right)^2$$

Power Calculations:

$$y = a^x$$

$$\left(\frac{s_y}{y}\right) = |x| \left(\frac{s_a}{a}\right)$$

Exponential Calculations:

$$y = \exp(a)$$

$$\frac{s_y}{y} = s_a$$

Natural Logarithmic Calculations:

$$y = \ln(a)$$

$$s_y = \frac{s_a}{a}$$

General Formula:

$$y = f(a)$$

$$s_y = \left| \frac{dy}{da} \right| s_a$$