A few useful mathematical functions for Data Science

Combinations: The number of distinct ways of choosing k items from a set of n:

$$\binom{n}{k} = \frac{n!}{k!(n-k)!}$$

Stirling's formula: To approximate the value of a large factorial:

$$n! \approx \sqrt{2\pi} e^{-n} n^{n+1/2}$$

Common limit for e: For a constant a:

$$\lim_{x \to 0} (1 + ax)^{1/x} = e^a$$

Newton's Formula: For a positive integer n:

$$(a+b)^n = \sum_{j=0}^{n} \binom{n}{j} a^j b^{n-j}$$