Binomial Theorem

Use the Binomial Equation to find the probability of a certain number of successes after a number of events

Binomial Equation

$$= \binom{n}{k} p^k * (1-p)^{n-k}$$

where $\binom{n}{k}$ is the combination formula, n is the total number of events, k is the number of successes, and p is the probability of a success for a single event

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

Example - You are playing a game, and the odds of winning are 25%. What are the odds of winning 2 times in 5 games?

Here, n = 5, p = .25, k = 2

$$= 10 * .0625 * .421875 = 26.36\%$$

From Combination Equation or Pascal's Triangle

The $\binom{n}{k}$ value can also be calculated from Pascal's triangle, in the location corresponding to 5 events, 2 successes (6th row, 3rd column)

Pascal's Triangle