Permutations -

factorial is number of possibilities

e.g. how many words can be made by rearranging the letters of VECTOR

6! = 6x5x4x3x2x1 = 720

trickier permutations- how many 4 letter words can be made by rearranging GHIJKLM

7!/3! = 840

options!/(options-limit)!

because 7!/3! = 7x6x5x4 x 3!/ 3!

Combinations if you dont care about order e.g abb is the same as bab then divide by the factorial of the limit e.g.

7!/(7-4)!4!

if we have n objects and want to choose a group of r of them where order does not matter, (n) (r) = n!/r!(n-r)!

82!/80!2!

82 * 81 / 2!

Binomial Theorem

fancy way to multiple out brackets ig

$$F(t) = 1 - e^{-(\lambda t)^{\alpha}} \tag{1}$$