If events 𝐴 and 𝐵 are independent, then Pr (𝐴𝐵) = Pr(𝐴)Pr(𝐵)

The addition rule states that Pr(𝐴 ∪ 𝐵) = Pr(𝐴) + Pr(𝐵) − Pr(𝐴𝐵)

If events 𝐴 and 𝐵 are disjoint, then Pr(𝐴𝐵) = 0 so that Pr(𝐴 ∪ 𝐵) = Pr(𝐴) + Pr(𝐵)

Pr(𝐴 ∪ 𝐵 ∪ 𝐶) = Pr(𝐴) + Pr(𝐵) + Pr(𝐶) – Pr(𝐴𝐵) – Pr(𝐴𝐶) – Pr(𝐵𝐶) + Pr(𝐴𝐵𝐶)

Pr(!A) = 1 – Pr(A)

A ∪ !A = ∪

If AB = A, Pr(AB) = Pr(A)

If 𝐴 ∪ 𝐵 = 𝐵, Pr(𝐴 ∪ 𝐵) = Pr(𝐵)

Pr(𝐴 |𝐵) = Pr(𝐴 ∪ 𝐵)/Pr(𝐵)

Pr(𝐴) = Pr(𝐴𝐵) + Pr(𝐴\*!B)

Pr(𝐴) = Pr(𝐴|𝐵)Pr(𝐵) + Pr(𝐴|!𝐵)Pr(𝐴\*!B)

no replacement and order not important = combination

no replacement and order important = permutations

With replacement and order important = strings

With replacement and order not important = unordered sample replacements

Probability of event = number of occurances/total number possible

Nck = n!/(k!(n-k)!)

Npk = n!(n-k)!

𝐸[𝑋] =

Discrete distribution

𝐸[𝑋] =

Var[X] = ((b-a+1)^2 – 1)/12

Bernouli

E[X] = p

Var[X] = p(1-p)

Geometric distribution

E[N] = 1/p

Var[N] = (1-p)/p^2

Uniform distribution

f(x) = 1/(b-a)

F(x) = (x-a)/(b-a)

E[X] = (a+b)/2

Var[X] = ((b-a)^2)/12