Probability Summarized

And / Or concept:

Suppose there are 5 red pens, 3 blue pens, and 2 black pens:

The probability of getting a red or blue pen will be $\frac{5}{10}+\frac{3}{10}$.

The probability of getting a red and a blue pen will be $\frac{5}{10}\bullet\frac{3}{10}$.

When order matters:

Permutations are used when there are no repetitions:

To arrange 5 books on a shelf out of 7 books will be ${}_7P_5$.

To Create a 3 digit pass code with repetition will be 10.10.10.

To Create a 3 digit pass code without repetition will be 10.9.8 or ${}_{10}P_3$.

When order doesn't matter:

This is combinations.

To choose a set of 5 out of 7 books regardless of order will be ${}_7C_5$.

Probability of any event = $\frac{\text{number of Event}}{\text{number of Sample Space}}=\frac{n(E)}{n(S)}$.

Mutually Exclusive (impossible for both events to occur at the same time): P(A or B) = P(A) + P(B)

Overlapping : P(A or B) = P(A) + P(B) – P (A and B)