Session 09: Probability

9A.1 Counting Methods

9A.2 Counting using Sets

9A.3 Probability

9A.4 Independent Events

9B.1 Permutation

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

$$\binom{6}{3} = \frac{6!}{(6-3)!3!} = \frac{6!}{3! \times 3!}$$

$$\frac{6!}{3! \times 3!} = \frac{6 \times 5 \times 4 \times 3!}{3! \times 3!} = \frac{120}{6} = 120$$

- $\binom{6}{2} = 15$
- $\binom{5}{2} = 10$
- $\binom{4}{0} = 1$
- $\binom{4}{3} = 4$
- pairwise disjoint sets
- The addition principle

Theorem

$$|A \cup B| = |A| + |B| - |A \cap B|$$

Probability

9B.2 The sample space of an experiment (S)

9B.3 The size of a sample space

9B.4 Indepedent Evcents (9.3.1)

Session 9 Probability

Binomial Coefficients

- factorials

$$n! = (n) \times (n-1) \times (n-2) \times \ldots \times 1$$

  - $5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$
  - $3! = 3 \times 2 \times 1$

- Zero factorial

$$0! = 1$$

The complement rule in Probability
$P(C') = 1 - P(C)$
If the probability of C is 70% then the probability of C' is 30%