THE ADDITION RULE

The Addition Rule is used to calculate the probability that either (or both) of 2 events will happen. It is listed below. We subtract P(A and B) to avoid double counting.

P(A or B) = P(A) + P(B) - P(A and B)

Special Case: Mutually Exclusive Events

If the 2 events are *mutually exclusive*, that is if they can't BOTH happen!

- If they both cannot happen, what is **P(A and B)**?

- Simplified Equation for Mutually Exclusive Events:

**Disjoint is another word that means mutually exclusive.*

Intersection and Unions

These can often be seen using Venn Diagrams. Draw a Venn Diagram for two events, A and B. Draw the scenario for mutually exclusive events and non-mutually exclusive events below.

Intersection: The A and B section where the two circles overlap is called the intersection. The intersection of 2 sets is the set of elements that are common to both sets. The intersection symbol is ∩.
Union: The union of 2 sets is the set that contains all elements of both sets. The symbol for union is ∪.

Puzzles:

What is the probability of getting either a 3 or a 4 on one roll of die? Are the 2 events mutually exclusive?

What is the probability of drawing a card from a full deck and getting either a heart or a queen? Are the 2 events mutually exclusive?

What is the probability of drawing a card from a full deck and getting either a heart or a spade? Are the 2 events mutually exclusive?