AP Stats: Lunchtime Review #5 and #6
Probability

· infinite number of repetition

Simulations
RECREATE A SCENARIO USING ONLY CHANCE BEHAVIOR TO control outcomes

FINITE LIST

Sample Space
· LIST OF ALL POSSIBLE OUTCOMES
· TREE DIAGRAM

Law of Large Numbers: THE PROPORTION OF TIMES AN OUTCOME OCCURS IN MANY REPETITIONS WILL APPROACH A CERTAIN NUMBER

$P(X)$ ← event, value of desired event

Probability

THE VALUE THAT IS APPROACHED VIA LAW OF LARGE #S

Some basic rules:

$0 \leq P(X) \leq 1$

Complement Rule

$P(A^c) = 1 - P(A)$

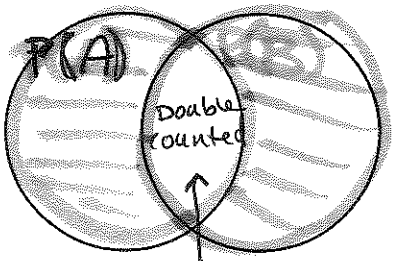
"AT LEAST 1": $1 - P(\text{none})$

TWO + EVENTS

Mutually Exclusive Events
· cannot occur simultaneously

Independent Events
· when knowing one outcome does not affect the chance of another

Two events



$A \cap B$

General Addition Rule

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$A \cup B$ "A or B"
↖ union of A & B

· consists of all outcomes in A, in B, but not both

$A \cap B$
↖ intersection of A and B
· "A and B"
· Both A and B

Conditional Probability

PROBABILITY THAT AN EVENT HAPPENS, GIVEN ANOTHER HAS OCCURED.

$P(A|B) = \frac{P(A \cap B)}{P(B)}$ ←

↑ given

⇩

$P(A \text{ and } B)$ ←

$P(A|B)\,P(B) = P(A \cap B)$

General Multiplication Rule

↳ find prob that two events happen in sequence