Bayes Rule

Ex: Suppose that 46% of the population is male and that 82% own a computer. If 71% of females own computers, what is the probability that

(a) A randomly selected person does NOT own a computer?

(b) A randomly selected person owns a computer?

(c) If the person selected owns a computer, what is the probability that the person was female?
**Ex:** Suppose that 3% of the population has a rare disease. The CDC has a test that is 98% effective if the person has the disease and 97% effective if the person does NOT have the disease. If a person is given this test what is the probability that

(a) the test will be positive?

(b) the test will be negative?

(c) If the test is positive, what is the probability that the person actually has the rare disease?
Counting

Fundamental Counting Principle

If event A can occur in \( m \) different ways and event B can occur in \( n \) different ways then both events can occur in \( mn \) different ways.

Ex: SSN  X  X  X  X  X  X  X  X  X  X

Ex: Phone Numbers (562)  X  X  X  X  X  X  X  X

Ex: Lottery  X  X  X  X  X  X  X
Permutations

Combinations

**Ex:** This semester a math 150 class has 2 Republicans, 6 Democrats, 4 Independents, and 3 Communists. A 4-member committee will be formed. What is the probability that:

(a) 1 Republican, 1 Democrat, and 2 Independent are chosen?

(b) 1 Republican and 3 Communist are chosen?