

Probability Continued

- Probability and Tables
- Simulation
- Counting

Tables and Probability

Example: The table below shows the outcome of a recent survey on student's major.

	Science	Humanities	Other
Male	70	60	30
Female	50	80	10

If a student is selected at random find the probability that the student is

- A. Not a science major.
- B. Male given the student is a science major
- C. Female and a humanities major
- D. Male or a humanities major

Inequalities

Suppose you roll a 6-sided die. Then

- **At least 4** means 4, 5, or 6.
- **At most 4** means 0, 1, 2, 3, or 4.
- **Less than 4** means 0, 1, 2, or 3.
- **More than 4** means 5 or 6.

Complements:

- **At least and less than**
- **At most and more than**

Simulation and the TI 83/84

1. Select **Math** then **PRB** then **randInt**.
2. Enter the minimum, maximum, number of numbers desired.
3. Enter **STO** then **L1** (second 1) then **Enter**.
4. You now have data in a list. Now you can run stats on it as before.

Fundamental Counting Rule

For a sequence of 2 events in which the first can occur in m ways and the second in n ways, the events together can occur in a total of $m \times n$ ways.

- **Example:** If you pick a card from a 52 card deck then roll a 6 sided die, there are $52 \times 6 = 312$ possible outcomes.

Combination

The number of ways of selecting r items out of a total of n items to choose from given that the order of the items is not taken into account is

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

For the TI 83/84, to find the number of ways of selecting 5 items out of a total of 8 items, type in 8 then **Math** -> **PRB** -> **nCr** then **5** then **ENTER**.

The California Lottery

- To play the California Lottery, pick **5** numbers from **1** to **56** and one number from **1** to **46**. You win **\$51,000,000** if your numbers are selected.
- What is the probability of winning the lottery with one ticket?

Royal Flush in 5 Card Stud

- The game of 5 Card Stud involves the player getting 5 cards. A Royal Flush means that the player gets Ace, King, Queen, Jack, Ten of the same suit in any order. Find the probability of getting a Royal Flush in 5 Card Stud.