Last name _____

First name _____

LARSON—MATH 350—CLASSROOM WORKSHEET 18
Combinatorial Probability

Review

- What is a *experiment*, *sample space* S, *event*, *uniform sample space*, *probability* of an event E in a uniform sample space $P(E)$.
- Why is $0 \leq P(E) \leq 1$?
- What is the *complement* $\bar{E}$ of an event E?
- Why does $P(\bar{E}) = 1 - P(E)$?
- Two events A and B are *independent* if

$$P(A \cap B) = P(A) \cdot P(B)$$

Consider the experiment of flipping a coin 5 times. Assume heads and tails are equally likely on each toss.

- What is the total number of possible outcomes of this experiment?
- What is the probability of getting exactly 1 head?
- What is the probability of getting exactly 3 heads?
- What is the probability of getting exactly 5 heads?
- Find the probability of getting an odd number of heads.
- Find the probability of getting an even number of heads.
- Are the events of getting an odd number of heads and an even number of heads independent?

1. What is the Monty Hall Problem?

2. Graph the *probability distribution* for flipping a fair coin 5 times (graph the number of heads on the x-axis and their probabilities on the y-axis).

3. What's the probability of flipping between 3 and 4 heads?

4. Graph the *probability distribution* for flipping a fair coin 8 times (graph the number of heads on the x-axis and their probabilities on the y-axis).

5. What's the probability of flipping between $4-1$ and $4+1$ heads (interpret "between" *inclusively*, that is, including the outcomes of 3 and 5 heads)?

6. What is a version of the *Law of Large Numbers*?