Last name _____

First name _____

LARSON—MATH 350—CLASSROOM WORKSHEET 19
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

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

1. 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).

2. 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)?

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

4. You flip a fair coin $2m$ times What's the probability of flipping between $m - 1$ and $m + 1$ heads?

5. How many flips are required so that there is a 99% chance that you get between 49 and 51% heads?

Integers!

6. What does it mean for integer a to *divide* integer b (that is, $a|b$)?

7. If a, b are integers and $b = aq + r$ (for integers q, r with $0 \leq r < a$), what are q and r called?

8. (**Claim:**) Every positive integer can be written as the product of primes, and this factorization is unique up to the order of the prime factors.