> The excitement that a gambler feels when making a bet is equal to the amount he might win times the probability of winning it.
>
> —Blaise Pascal (1623–1662)

Tuesday, October 3: Quiz today, on Sections 5.1, 5.2, 5.3. Bring your homework notebook.

Review section 5.3 and **read** section 5.4.

1. What's the complement of the complement of a set?
2. Suppose that $n(S) + n(T) = n(S \cup T)$. What can you conclude about S and T?
3. At a certain state college in Northern California, there are 2100 first-year students. 1600 of them take a math course, 550 take math and economics courses, and 300 don't take any math or economics. Draw the appropriate Venn diagram.
4. How would you explain the multiplication principle to a friend?
5. A multiple-choice exam has 6 questions, each with 6 different answers. How many different ways are there to complete the exam?
6. Joe has 5 pairs of pants: blue, black, red, green, purple. He has 7 shirts: blue, black, red, green, purple, orange, and white. How many non-matching outfits does he have to choose from?

Exercises: 5.3: 3, 7, 11, 13, 19, 21, 41–46. **5.4:** 5-6, 14, 21, 29, 37, 45, 50, 54.

Thursday, October 5: Read section 5.5.

1. Explain the difference between permutations and combinations.
2. Why is $C(n, r)$ just $P(n, r)$ divided by $r!$?
3. How many different lines can 6 people form?
4. There are 8 candidates running for 5 seats on the school board. How many different possibilities are there for the composition of the school board?

Exercises: 5.5: 3, 6, 12, 14, 19, 27, 32, 53, 55, 76, 79.

Tuesday, October 10: Read Sections 5.6, 6.1 and 6.2.

1. A coin is tossed 7 times and the sequence of heads and tails is recorded. How many possible sequences are there?
2. How many of these sequences have exactly 3 heads?
3. How would you explain to someone when to use $P(n, r)$ and when to use $C(n, r)$?
4. How many poker hands consist of 4 clubs and one card of a different suit?
5. Be ready to define the terms **experiment, outcome, sample space,** and **event**.
6. If I flip three coins and record the sequence of heads and tails, what is an *impossible event*?

7. For the experiment above, are the events "at least two heads" and "at least one tail" mutually exclusive?
8. If you performed the experiment 1000 times, about how many times would you expect to get 0 heads? 1 head? 2 heads? 3 heads?

Exercises: 5.6: 1, 4, 7, 12, 14, 27, 36, 42. **6.2:** 2, 7-9, 19-20, 26-27.

Thursday, October 12: Quiz Today, through the reading for Tuesday.

Read section 6.3.

1. If I have an unfair coin, which will land heads-up with probability .6, what is the probability it will land tails-up?
2. If you toss a coin 4 times, how many heads would you expect to get?
3. If you do the experiment above 16 times, would you expect to get 0 heads once, 1 head four times, etc. as in the probability chart on page 255?
4. What are the Fundamental Properties and the Addition Property?
5. If the probability that I'm wearing a sweater is .5, the probability that I rode my bike today is .7, and the probability that I did both is .3, what's the probability that I am wearing a sweater or rode my bike or both?
6. If the paper says that the Seawolves are favored in their soccer game with 3:2 odds, what is the probability that they will win?

Exercises: 6.3: 1, 6, 7, 16, 19, 21-22, 25, 28, 30.

Tuesday, October 17: Read section 6.4.

1. Which of these experiments has equally likely outcomes?
   - Flip a coin 4 times and record the number of heads.
   - Roll two dice and record the product of the two numbers.
   - Flip two coins and record whether they are the same or different.
   - From a bag containing two red balls, a blue ball, and a green ball, draw two balls and record their colors.
   - From a bag containing a red ball, a blue ball, a green ball, and a blue ball, draw two balls and record their colors.
2. For each experiment above, find the sample space.
3. What is the probability that two people in our class of 49 have the same birthday?

Exercises: 6.4: 3, 7, 11-14, 22, 27, 37, 44, 46.