Conditional Probability and Intersections of Events (Section 13.3)

The objectives for this section include:

1. Understand how to compute conditional probability.
2. Calculate the probability of the intersection of two events.
3. Use probability trees to compute conditional probabilities.
4. Understand the difference between dependent and independent events.

1) **Class Practice –** Use Pascal's Triangle to answer the following:

```
                1
              1   1
            1   2   1
          1   3   3   1
        1   4   6   4   1
      1   5  10  10  5   1
    1   6  15  20  15  6   1
```

a. Which of the numbers is the triangle is the number of ways you could award two identical prices from five contestants?

b. In the bottom row of the triangle above which of the following would give you 20?

$_7C_3$ $_7P_3$ $_6C_4$ $_6P_4$ $_6C_3$ $_6P_3$

2) **Class Practice –** We draw two cards from a standard deck of cards.

a) What is the probability that you draw two Kings with replacement?

b) What is the probability that you draw two Kings without replacement?

Work #14 from p.757

When we compute the probability of event *F* assuming that the event E has already occurred, this is called the conditional probability of event F given E, This is denoted as $\boldsymbol{P(F \setminus E)}$

Rule for Computing $\boldsymbol{P(F \setminus E)} = \dfrac{P(E \cap F)}{P(E)}$

3) **Class Practice** Two standard dice are rolled. Given *E* - a total that is less than 5, and F – the total is even

Find $P(F \setminus E)$

Complete **Quiz Yourself** **6** on p. 749

Rule for Computing the Probability of the Intersection of Events can be found by

taking $P(F \setminus E) = \dfrac{P(E \cap F)}{P(E)}$ and solving for $P(\text{E} \cap \text{F})$

4) **Class Practice**

If the $P(D \setminus B) = ½$ and $P(B) = ½$ find $P(D \cap B)$

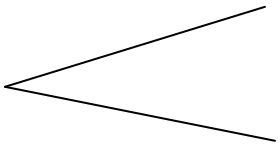
Events are **independent** which means the first event has no effect on the probability of the second event. When events E and F are independent then $P(F \setminus E) = P(F)$.

Example: The probability of getting a heads after drawing a card is the same as just flipping the coin and getting a heads. In other words _____

_____

Complete **Quiz Yourself** **8** on p. 752

a.



b.

Assignment for Monday 10/26
Read pp. 745-757, Finish Guided Notes pp. 52-54
Complete #1, 5, 11, 13, 15, 19, 23, 25, 27, 31, 53-56 on pp. 757-759

Quiz over Sections 13.1-13.3 on Monday so review by working through the handouts and problems over those three sections