Solutions to Practice Probability Ditto

1. We know that the probability of winning plus the probability of losing must be one (because one of two things will happen). So P(losing) = 1 - .6 = .4.

2. The number of successes is three, the number of even numbers on a die. The total number of possibilities is 6, the number of sides on a die. Therefore P(even) = $\frac{3}{6}$.

3. a.) The number of successes is 2, the number of red Queens in the deck. The total number of possibilities is 52, the number of cards total. So P(red Queen) = $\frac{2}{52}$.

   b.) The number of successes is 50, the number of cards that are not red Queens. The total number of possibilities is 52, the number of cards total. So P(not a red Queen) = $\frac{50}{52}$.

   c.) We know the events "red Queen on first draw" and "not a red Queen on second draw" are independent since we replace the first card before selecting the second. This means that the card we select on the first draw does not affect the card we select on the second draw. Since the two events are independent, we can say the P(red Queen on first and not red Queen on second) = $\frac{2}{52} * \frac{50}{52}$.

4. a.) The number of successes is 15, the number of red marbles. The total number of possibilities is 20, the number of marbles in the bag. Hence P(red) = $\frac{15}{20}$.

   b.) The number of successes is 5, the number of green marbles. The total number of possibilities is 20, the number of marbles in the bag. Hence P(green) = $\frac{5}{20}$.

   c.) Since the two events "red on first draw" and "green on second" are independent, we have P(red on first and green on second) = $\frac{15}{20} * \frac{5}{20}$.

5. The fact that you replace the first marble before you select the second makes the two events independent. Remember independent means the two events do not affect each other.

6. Think about this using experimental probability. Imagine rolling a die 10 times and counting the number of 4's you get. Probability is the number of successes divided by the total number of possibilities. To have probability be more than one, you would need the numerator (number of successes) to be more than the denominator (total number of possibilities).

The total number of possibilities is 10, because that is how many times you roll the die. The number of successes is the number of times the die came up a "4". You cannot get more successes than the total number of times you roll the die. Hence probability cannot be more than one.