1. A combination lock has 4 wheels, each with the digits 0 through 9. If an opening combination is a sequence of 4 digits with no repeats, what is the probability that a person guesses the right combination?

2. A deck of playing cards consists of 4 suits (spades and clubs, which are black, and hearts and diamonds, which are red) each consisting of 13 “numbers” (2-10, J, Q, K, A) PLUS 2 Jokers (54 cards in total). A 5-card hand is dealt.
   (a) What is the probability of getting all black cards?
   (b) What is the probability of getting all cards of the same suit?
   (c) What is the probability of getting exactly 3 cards of the same number, a Joker, and a different card?
   (d) What is the probability of getting at least one Joker?

3. Twelve different pizza places participate in a blind taste study for consumer recognition. If a participant samples three at random and guesses which place they came from (without repeating answers), what is the probability that he or she identify all 3 correctly?

4. A shipment of 80 Fitbits include 8 defective ones. A sample of 6 are chosen for testing and the shipment will be rejected if at least one is defective. What is the probability it is rejected?

5. The Pick-3 Lottery consists of drawing one ball from each of three ordered bowls with numbers 0 through 9.
   (a) If you play, what is the probability of matching all 3 numbers?
   (b) What is the probability of matching exactly 2 numbers?

6. I have a sock drawer with six blue socks, eight black socks, four khaki socks, and ten brown socks.
   (a) If I pull out two socks at random, what is the probability I pull out a matching pair?
   (b) I'm colorblind and can't tell the difference between the blue and black socks. What is the probability I get one of each (and therefore go to work in mismatched socks)?
   (c) What is the probability that I pull exactly one blue sock or exactly one black sock?
   (d) The socks are identical except for color. How many distinguishable ways can I arrange them in a row?
   (e) What is the probability that the arrangement in the previous question has all colors lined up together?
2 Section 2.4

1. You roll a 20-sided die to attack a Level-5 Orc, causing damage to it whenever you roll a 15 or higher. If you attack four times...
   (a) What is the probability that you will cause damage exactly twice?
   (b) What is the probability that you will cause damage at least twice?

2. You are completely unprepared for a ten-question true-false pop quiz. What is the probability of getting at least 60% by randomly guessing?

3. A pharmaceutical lab claims that a new drug causes a certain side effect in 2% of users. To test this claim, a research firm administers the drug to 10 randomly chosen people and finds that exactly 3 suffered the side effect. What is the probability that this should happen, based on the lab’s claim?

4. Suppose the probability of contracting influenza upon exposure is 0.7. If a group of 50 people are exposed...
   (a) What is the probability that less than half of them contract influenza?
   (b) What is the probability that more than 30 but at most 40 people contract influenza?

(b) Put coins into a slot machine until you win. Let $X =$ the number of coins you played.

(c) Draw cards from a standard 52-card deck without replacement until an ace is drawn. Let $X =$ the number of cards drawn.

(d) A probability problem is solved during a 2-hour week in review. Let $X =$ the number of minutes it takes to solve the problem.

3 Section 3.1

1. List or describe the possible values of the following random variables. Classify the variable as finite discrete, infinite discrete, or continuous.
   (a) Put 10 coins into a slot machine. Let $X =$ the number of times you win money back

2. Two fair 4-sided dice (#1-4) are tossed. Let $X =$ the difference between the larger and smaller number. Find a probability distribution for $X$.

3. Three cards are chosen from a standard 52-card deck. Let $X =$ the number of spades drawn. Find the probability distribution of $X$. 