**Week 2 Quiz**

1. Heights of men on a baseball team have a bell-shaped distribution with a mean of 177cm and a standard deviation of 5cm. Using the empirical rule, what is the approximate percentage of the men between the following values?
2. 167cm and 187cm
3. 162cm and 192cm
4. Heights of women have a bell-shaped distribution with a mean of 163cm and a standard deviation of 5cm. Using Chebyshev’s theorem, what do we know about the percentage of women with heights that are within 3 standard deviations of the mean? What are the minimum and the maximum heights that are within 3 standard deviations of the mean?
5. At least \_\_\_\_\_ % of women have heights within 3 standard deviations of 163cm. (Round to the nearest Percent)
6. The minimum height that is within 3 standard deviations of the mean is \_\_\_\_\_ cm.
7. The maximum height that is within 3 standard deviations of the mean is \_\_\_\_\_ cm.
8. Determine whether the distribution is a discrete probability distribution:

x P(x)

1. 0.28
2. 0.32
3. -0.20
4. 0.32
5. 0.28

Is the probability distribution a discrete distribution? **Why?** Choose the correct answer below:

1. No, because some of the probabilities have values greater than 1 or less than 0
2. No, because the total probability is not equal to 1
3. Yes, because the probabilities sum to 1 and are all between 0 and 1, inclusive.
4. Yes, because the distribution is symmetric
5. In a state’s Pick 3 lottery game, you pay $1.28 to select the sequence of three digits, such as 222. If you select the same sequence of three digits that are drawn, you win and collect $420.17. Complete parts A-E.
6. How many different selections are possible?
7. What is the probability of winning? \_\_\_\_\_ (Enter integer or decimal)
8. If you win, what is your net profit? (Enter integer or decimal)
9. Find the expected value. \_\_\_\_\_ (Round to the nearest hundredth as needed)
10. If you bet $1.28 in a certain state’s Pick 4 game, the expected value is $0.86. Which bet is better, a $1.28 bet in the Pick 3 game or a $1.28 bet in the Pick 4 game? Explain.
11. Neither bet is better because both games have the same expected value
12. The Pick 3 game is a better bet because it has a larger expected value
13. The Pick 4 game is a better bet because it has a larger expected value
14. Assume that a procedure yields a binomial distribution with a trial repeated n times. Use a binomial probabilities table to find the probability of x success given the probability p of success on a given trial. N=3, x=1, p=0.80

P (1) = \_\_\_\_\_ (Round to 3 decimal places as needed)

1. In a region, 70% of the population have brown eyes. If 10 people are randomly selected, find the probability that at least 8 of them have brown eyes. Is it unusual to randomly select 10 people and find that at least 8 of them have brown eyes? Why or why not?

**The probability that at least 8 of the 10 people selected have brown eyes is \_\_\_\_\_?** (Round to 3 decimal places as needed)

**Is it unusual to randomly select 10 people and find that at least 8 of them have brown eyes?** Note that a small probability is one that is less than 0.05

1. No, because the probability of this is occurring is very small.
2. Yes, because the probability of this occurring is not small.
3. Yes, because the probability of this occurring is very small.
4. No, because the probability of this occurring is not small.
5. Assume that a procedure yields a binomial distribution with n trials and the probability of success for one trial is p. Use the given values of n to find the mean and standard deviation. Also, use the range rule of thumb to find the minimum value and the maximum value. n=1540, p=2/5

**mean**= \_\_\_\_\_

**standard deviation**=\_\_\_\_\_ (Round one decimal place as needed)

**minimum value**= \_\_\_\_\_ (Round one decimal place as needed)

**maximum value**= \_\_\_\_\_ (Round one decimal place as needed)

1. A government agency has specialists who analyze the frequencies of letters of the alphabet in an attempt to decipher intercepted messages. In Standard English text, a particular letter is used at a rate of 7.2%.
2. Find the mean and standard deviation for the number of times this letter will be found on a typical page of 1900 characters.
3. In an intercepted message, a page of 1900 characters is found to have3 the letter occurring 169 times. Is this unusual?
4. Yes, because 169 is greater than the maximum usual value
5. Yes, because 169 is below the minimum usual value
6. Yes, because 169 is within the range of usual values
7. No, because 169 is within the range of usual values

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| Identify the properties that make flipping a coin 50 times and keeping track of heads a binomial experiment. | & | **What does it mean for the trials to be independent in a binomial experiment?**  |