**Practice FINAL EXAM**





1. If the probability of winning a game of chance at a carnival is 18% and you decide to play the game.

1. What is the probability that you win 3 out of 10 games played?
2. What is the probability that you do not get your first win until the 7th game?

2. You have a bag with 10 number tiles in it and the tiles are numbered from 1 – 10. You are going to select a tile and then record the number, then put the tile back in the back and repeat the process.

1. What is the probability that if you select 500 tiles you would get *less than* 220 odd numbered tiles?
2. What is the probability that you do not get your first odd numbered tile before your 5th selection?

3. What is the probability of flipping a coin and getting tails and then getting a blue marble from a bag that contains 4 red, 6 green, 8 blue and 2 orange marbles?

4. You are rolling a regular 6-sided die 120 times.

1. How many times would you expect to get a number *less than 3*?
2. What would be the standard deviation for number of times you roll less than a 3?
3. If thousands of people rolled the die 120 times each and someone stated that they rolled a number less than 3 *fifty-five* times, approximately what percentage of people rolled a number less than 3 *more then* that person did?

5. Sara is taking a test in her science class and her math class, if the class average in science was a 72% and the standard deviation was 8%, compared to an average of 78% and a standard deviation of 2% in her math class. Which tests did she do better on compared to the rest of the class given her score on the science test was a 90% and he math test score was a 83%? (Explain)

6. Given 11% of the population has type B blood.

7. In the histogram shown below describe the shape, the best measure for center and spread, and then explain how you think the mean compares to the median.



8) If out of 100 students surveyed at a school 46 of them said they like to watch the T.V show “Big Brother” what would be the value of p-hat, and is p-hat a statistic or a parameter?

9) Using the information from problem #1 what would be the approximate value of p and what would be the standard deviation of our sample proportion?

1. A population of manufactured products where the random variable X is the weight of the item. Prior experience has shown that the weight has a distribution with mean 5.0 ounces and standard deviation of 2.0 ounces.
	1. What is the probability that the weight of an item randomly selected will be more than 6.5 ounces?
	2. Using proper notation, show the distribution of?
	3. What is the probability that if the manufacturer takes a sample of 100 items, that it has a mean weight between 5.5 and 6.0 ounces?
2. Using the formula for margin of error () if you wanted to have a margin of error less than 5% using a 95% confidence interval (Z-score of 1.96) and the standard deviation of the population was 40, what would be the smallest sample size you could take?
3. The actual time it takes to cook a 20 – pound turkey is a normal random variable with a mean of 4.8 hours and a standard deviation of 0.5 hours.
4. What is the probability that a randomly selected 20-pound turkey will take less than 5 hours to cook?
5. What is the probability that the average cooking time of a 20 – pound turkey will take between 4.2 and 4.9 hours to cook?
6. Given that an average of 5 hours was found for a sample of 50 turkeys, calculate a 90% confidence interval for the average cooking time of a 20 – pound turkey.
7. Interpret the interval found in (c).
8. Is the parameter that you are trying to estimate in (d) actually in the interval? What is the parameter?
9. In a simple random sample of 400 students taken at a large university, 60 are math majors.
10. Construct an approximate 80%-confidence interval for the percent of students at the university who are math majors.
11. If you wanted to become more confident in your response without changing the sample size what would happen to your interval that you found in part a. (Explain in basic terms)
12. A recent drug survey showed an increase in use of drugs and alcohol among local high school seniors as compared to the national percent. Suppose that a survey of 100 local seniors and 100 national seniors is conducted to see if the percentage of drug and alcohol use is higher locally than nationally. Locally, 65 seniors reported using drugs or alcohol within the past month, while 60 national seniors reported using them.
13. You have been playing backgammon with your friend for years, and so far, winning had been pretty equal. But lately, your friend had so much luck, rolling sixes after sixes, that you wonder whether he is cheating. You both use your individual set of “lucky” dice, and you decide whether his set is naturally lucky or whether it is not. Since you are a math major with lots of time on your hand you decide to borrow one of his dice and roll them 1310 times, recording the number coming up each time.

Complete a Chi-Square Test to see if the die your friend is using appears to be a fair die.