MATH 132 - Exam 4 Review

All material covered in class is eligible for exam, this review is not all inclusive.

1. (7.1) The monthly temperature normals for Las Vegas are listed as follows:
   57, 63, 69, 78, 88, 100, 106, 103, 95, 82, 67, 58
   Find the five number summary and draw a box plot

2. (7.1) For the following five number summary, what criteria would be used to categorize a value as an outlier?
   MIN 60
   Q1 72
   MED 74
   Q3 82
   MAX 90

3. (7.3) Fifteen percent of the students who take a screening test are assigned to a remedial English class. In a group of eight students what is the probability that three will be placed in the remedial class? (Round to 3 decimal places)

4. (7.3) A jury has 12 jurors. A vote of at least 10 of 12 for "guilty" is necessary for a defendant to be convicted of a crime. Assume that each juror acts independently of the others and that the probability that any one juror makes the correct decision is 0.80. If the defendant is guilty, what is the probability that the jury makes the correct decision? (Round to 3 decimal places)

5. (7.3) Thirty percent of all cars crossing a toll bridge have a commuter sticker. What is the probability that among 10 randomly selected cars waiting to cross the bridge at least 2 have commuter stickers? (Round to 3 decimal places)

6. (7.3) The advertising agency that handles the Diet Supercola account believes that 40% of all consumers prefer this product over its competitors. Suppose a sample of 12 people is chosen. Assume that all responses are independent of each other. Find the probability, rounded to 3 decimal places, of the following:
   (a) Exactly 6 people like Diet Supercola.
   (b) No more than 2 people like Diet Supercola.
7. (7.4) A pair of dice is tossed and the larger of the two numbers showing is recorded. Find the expected value of this experiment. If both dice have the same number use that number as the highest. (Round to 2 decimal places)

8. (7.4) In a carnival game a single die is rolled. If the number that shows on top is odd you win that amount. If the number showing on top is even you lose that amount. Construct a probability distribution for this game and find the expected value for a person playing this game.

9. (7.4) In a carnival game you pay $1 to roll a pair of dice. If you get a 6, 7, or 8 you win $2 (you win $1 and you get your $1 returned), if you get anything else you lose $1. What is your expected value in this game?

10. (7.3) A fair 6-sided die is rolled 8 times. Find the probability, rounded to 3 decimal places, of rolling a ”4” exactly 2 times.

11. (7.6) Using the table for areas under the standard normal curve find:
   
   (a) $P(Z \leq -1.65)$
   (b) $P(Z \geq -1.50)$
   (c) $P(-1.20 \leq Z \leq -.50)$
   (d) Find $b$ such that $P(Z \leq b) = 0.7881$
   (e) Find $b$ such that $P(Z \geq b) = 0.0735$
   (f) Find $b$ such that $P(-b \leq Z \leq b) = 0.8064$

12. (7.6) At a soft drink bottling plant the amount of cola put into bottles is normally distributed with $\mu = 16.75$ ounces and $\sigma = 0.50$ ounces. What is the probability that a randomly selected bottle will contain less than 16 ounces.

13. (7.6) Suppose that the lifetimes of a certain light bulb are normally distributed with $\mu = 1200$ hours and $\sigma = 160$ hours. Find the probability that a randomly selected light bulb will burn out:

   (a) in less than 1000 hours.
   (b) in between 1000 and 1440 hours.
14. (7.6) Suppose that IQ scores are normally distributed with $\mu = 100$ and $\sigma = 10$.

(a) What is the probability that an individual selected at random has an IQ score of 125 or more?

(b) Find the 90th percentile of IQ scores. (Round to the nearest whole number)

15. (7.6) A teacher gives a test to a large group of students. The results are normally distributed. The mean is 74 with a standard deviation of 6. The teacher wishes to recognize the students who scored in the top 15% of the class. What is the cutoff score, to the nearest whole number, of the score needed for recognition?

16. (7.6) In nutrition, the Recommended Daily Allowance of vitamins is a number set by the government as a guide to an individual’s daily vitamin intake. As the result of a process, the Recommended Daily Allowance is defined as the mean plus 2.5 times the standard deviation. What is the probability, rounded to 4 decimal places, that a person will receive adequate amounts of vitamins under this plan?

17. (7.6) A mail order house uses an average of 300 mailbags per day. The number of bags needed each day is normally distributed with $\sigma = 50$. How many bags must the company on hand at the beginning of a day to be 99% certain all orders can be filled?

18. (7.7) A basketball player makes each free throw with probability 0.75. What is the probability of making 59 or more shots out of 75 attempts?

19. (7.7) The recovery rate of cattle from a certain disease is 0.22. If 200 cattle are affected what is the probability that at least 51 will recover?
20. (10.1) Six thousand dollars are deposited in a savings account at 6% interest compounded monthly. Find the balance after 3 years and the amount of interest earned during that time.

21. (10.1) In order to have $10,000 on his 25th birthday how much would a person who just turned 21 have to invest if the money will earn 6% compounded monthly?

22. (10.1) Calculate the amount after 18 months if $2000 is deposited at 6% simple interest.

23. (10.2) Find the present value of $2000 in 4 years at 7% simple interest.

24. (10.1) Determine the simple interest rate at which $980 grows to $1000 in 6 months. (Round to 2 decimal places)

25. (10.1) Determine the amount of time required for money to double at 5% simple interest.