MA 250 Mid Term Exam Name_____

1. Define inferential statistics.

2. What is the difference between a discrete variable and a continuous variable?

3. What is a simple random sample?

4. What is a systematic sample?

5. Explain the difference between Nonsampling errors and Sampling errors?

The data below (for questions 6-7) represents the number of cars that arrive at the Fort Sill Burger King drive-through between 1145-1200 each Friday for the past 50 weeks.

1	7	3	8	2	3	8	2	6	3
6	3	6	4	3	4	3	8	1	2
5	5	6	3	3	4	3	2	1	2
4	4	9	3	5	2	3	5	5	5
2	5	6	1	7	1	5	3	8	4

6. Construct a frequency distribution of the data.

7. Construct a relative frequency distribution of the data.

The frequency distribution below (for questions 8-9) represents the number of occurrences of a particular disease in the United States in 2009 by age.

Age	Occurrences	Age	Occurrences
5-9	7	55-59	1985
10-14	272	60-64	1332
15-19	1611	65-69	1212
20-24	2360	70-74	1220
25-29	2389	75-79	1219
30-34	2681	80-84	973
35-39	3176	85-89	538
40-44	3459	90-94	200
45-49	3260	95-99	28
50-54	2682		

8. Construct a relative frequency distribution.

9. Construct a frequency histogram.

10. Construct a stem-and-leaf plot for the number of grams of fat in various lunches at a fast food restaurant.

12	23	28	2	28	33
31	11	23	40	35	1
23	33	23	16	11	8
8	17	16	15		

The following data represents the pulse rate of 10 randomly selected persons after stepping up and down on a 6-inch platform for 3 minutes. The pulse was measured in beats per minute. Use the data to answer questions 11-12.

136	169	120	128	129
143	115	146	96	86

11. Determine the median pulse and range.

12. Compute the sample mean, sample variance and sample standard deviation.

13. The data below represents a random sample student response to the question: "How many hours per week you typically work outside the home?" What is the mode?

0	0	15	20	30
40	30	20	35	35
28	15	20	25	25
30	5	0	30	24
28	30	35	15	15

The data below (use for questions 14-16) represents the travel time of nine students (population) enrolled in a Columbia College course.

Student	Travel Time	Student	Travel Time
Amanda	39	Scott	45
Amber	21	Erica	11
Time	9	Tiffany	12
Mike	32	Glen	39
Nicole	30		

14. Compute the population mean, population variance and population standard deviation.

15. Using a random number generator, a random sample of the times of Amber, Mike and Glen has been determined. Compute the sample mean, sample variance and sample standard deviation.

16. How well does the sample represent the population? Compare the means, variances and standard deviations.

17. The highest batting average ever recorded was by ted Williams in 1941 when he hit .406. That year, the mean and standard deviation for batting averages were 0.28062 and 0.03281. In 2004, Ichiro Suzuki was the American League batting champion with a batting average of .372. In 2004, the mean and standard deviation for batting averages were 0.26992 and 0.02154. Who had the better year relative to their peers, Williams or Suzuki? Calculate z scores for each player to determine your answer.

18. Oklahoma is ranked 36 out of 51 states and the District of Columbia in the violent crime rate. What is the percentile rank of the state of Oklahoma? What percentage of states has higher crime rates than Oklahoma?

19. Suppose you toss a coin 100 times and get 87 heads and 13 tails. Based on these results, what is the probability that the next flip results in a tail?

The following probability model (questions 20-21) shows the distribution of the most popular selling Girl Scout Cookies.

Cookie Type	Probability
Thin Mints	0.25
Samoas/Caramel deLites	0.19
Peanut Butter Patties/Tagalongs	0.13
Peanut Butter Sandwich/Do-si-dos	0.11
Shortbread/Trefoils	0.09
Other varieties	0.23

20. If a girl scout is selling cookies to people who randomly enter a shopping mall, what is the probability that the next box sold will be Peanut Butter Patties/Tagalongs or Peanut Butter Sandwich/Do-si-dos?

21. If a girl scout is selling cookies to people who randomly enter a shopping mall, what is the probability that the next box sold will not be Thin Mints?

22. Craps is a dice game in which two dice are thrown. If the shooter rolls a 7 or 11 on the first roll, the shooter wins. If the shooter rolls a 2,3,or 12 on the first roll, the shooter loses.

a. Compute the probability that the shooter wins on the first roll.

b. Compute the probability that the shooter loses on the first roll.

23. For a state's lottery PICK 4 game, a player must match a sequence of four repeatable numbers, ranging from 0 to 9 in exact order (for example 4-9-6-2). For a single ticket, what is the probability of matching the four winning numbers?

24. The U.S. Senate Appropriations Committee has 29 members. Suppose that a subcommittee is to be formed by randomly selecting 5 of the members of the Appropriations Committee. How many different subcommittees could be formed?

25. In the game of five-card stud, one card is dealt face down to each player and the remaining four cards are dealt face up. After two cards are dealt (one face down and one face up), the players bet. Players continue to bet after each additional card is dealt. Suppose that three cards have been dealt to each of the five players at the table. You currently have three clubs in your hand (all cards of the same suit). Of the cards dealt, there are two clubs showing in other players' hands. There are 13 clubs in a standard 52 card deck.

a. How many cards are not known to you after three cards have been dealt?

b. Of the cards unknown to you, how many are clubs?

c. You are seated to the dealer's left and you will be dealt the next card. What is the probability that your next card will be a club?

Extra credit: Prior to the fourth or fifth cards being dealt, what is the probability you will be dealt two clubs in a row? Assume no other clubs are dealt except to you. Based on this probability, should you stay in the hand?