Math 21   Midterm Review

1) A survey of 500 randomly selected college students produced a mean age of 23.4 years old. Is the following statement an example of descriptive or inferential statistics?

"The mean age of all college students is greater than 22 years old."

2) The scores on a career aptitude test are reported as poor, below average, average, above average, and superior. What level of data would this be an example of?

3) The scores on an IQ test would be an example of what level of data?

4) A random sample of 98 high school students had their blood drawn. Their blood types (A, B, AB, O) would be an example of what level of data?

5) A frequency distribution is used to present the weights of 1641 eighth-grade boys. This would be an example of what level of data?

6) A student interested in the percentage of college students who have seriously considered dropping out of college gathers data by interviewing students who are buying textbooks at the bookstore. This would be an example of what type of sampling?

7) The last time Mr. Woodbury taught Math 21 in the summer, 28 students passed, 2 dropped, and 10 failed. Create a pie chart to represent this data.

8) Here is a frequency distribution showing the ages of 66 people at a baseball game.

Ages	Frequency
25 to 35	25
35 to 45	14
45 to 55	11
55 to 65	10
65 to 75	4
75 to 85	2

a) Construct a histogram to represent this data.
b) Create a relative frequency distribution.
c) Describe the shape of the distribution.

9) Ten men who were at least 60 years old were selected at random and their serum cholesterol level was measured. Here are their levels, in mg/dL.

177   197   190   185   231   160   181   285   222   197

Calculate the following:
Mean, Median, Mode, Q1, Q3
Range, Interquartile Range, Standard Deviation, Variance
Construct a boxplot. Identify any outliers.

10) Use the stem-and-leaf display to find the 5-number summary (Min, Q1, Median, Q3, Max) for this data, and draw a boxplot. Be sure to denote outliers on your graph.
(There are 55 values.)

Stem	Leaf
3	234555678889
4	00011123344555689
5	0011114566789
6	0113456
7	1457
8	1
9	6

11) Here are the number of hours that ten students spent studying for a final exam, and their score on that exam.

Hours	7	8	4	9	13	5	9	6	16	3
Score	70	76	57	77	91	66	82	64	96	50

a) Create a scatterplot for this data.
b) Compute the correlation coefficient r.
c) Determine whether there is a linear association between hours studied and exam score. If so, is it positive or negative?

12) Here are the scores of five randomly selected students on Test 1 and Test 2 in a math class.

Student	Test 1 Score	Test 2 Score
1	83	82
2	86	84
3	76	63
4	92	83
5	71	55

a) Find the equation of the regression line, treating the score on Test 1 as x and the score on Test 2 as y.
b) What is the slope of the line? What does the slope tell you?
c) Predict the Test 2 score for a student who had a score of 80 on Test 1.

13) In a drug trial there are 8 participants. In how many different ways can three of the participants be selected to receive a placebo?

14) A sprint race has 12 runners in it. In how many different ways can the runners finish first, second, third and fourth?

15) A pizza restaurant has 5 different crusts available and 11 pizza toppings. Assuming that a customer cannot select the same topping more than once, in how many different ways can a customer order a 4-topping pizza?

16) The probability that a registered voter is female is 0.5. The probability that a registered voter is registered as an independent is 0.3. The probability that a registered voter is female and is registered as an independent is 0.2.

a) Find the probability that a registered voter is female or independent.
b) If a randomly selected voter is a female, find the probability that she is registered as an independent.

17) Seven males and five females are to be interviewed for a job as a community college instructor. The top four candidates are sent forward to the president for a second interview. If all the candidates are equally qualified, find the probability that four females get a second interview.

18) A recent report stated that 84% of all elementary school teachers have a computer at home. If 12 elementary school teachers are selected at random, find the probability that 8 of them have a computer at home.

19) Sixty percent of the students at a particular community college are female. If 13 students at that community college are selected at random, find the probability that between 5 and 10 students, inclusive, are female.

20) Ten percent of the adults in a certain city hold a bachelor's or higher degree. If 5 adults from this city are selected at random, find the probability that at least 3 do **not** have a bachelor's or higher degree.

21) On a typical day at UC Santa Barbara there are 2.9 bike crashes per day. Find the probability that there will be 2 bike crashes on that campus today.

22) On an average day there are 2 students absent from my math 21 class. Find the probability that 3 or more students are absent from my math 21 today.

23) On average, the Fresno Grizzlies score 4.7 runs per game. Find the probability that the team scores exactly 11 runs in the next two games.

24) The weights of salmon fillets at a fish market follow a normal distribution with a mean of 21 ounces and a standard deviation of 2.3 ounces. Find the probability that an individual salmon fillet will weigh more than 25 ounces.

25) IQ scores are approximately normally distributed with a mean of 100 points, and a standard deviation of 15 points. Find the probability that a person has an IQ of 110 or lower.

26) The heights of adult males are normally distributed with a mean of 69.0 inches and a standard deviation of 2.8 inches. What height separates the shortest 15% of adult males from the rest?

27) Forty percent of the households in a particular county have a computer. If 200 households in that county are selected at random, use the normal approximation to estimate the probability that between 70 and 100 (inclusive) have a computer.

28) Use a QQ Plot to determine whether the following data come from a population that is normally distributed.
Times, in seconds, for greyhounds to run a 5/16-mile race.

| 31.26 | 31.35 | 31.91 | 32.06 | 32.37 | 32.52 |