

Math 2200 Spring 2014 Exam 1

There are 25 multiple choice questions, each worth 4 points.

You may use a graphic calculator with statistics functions, such as TI83, TI84 or TI89. No other aids are allowed.

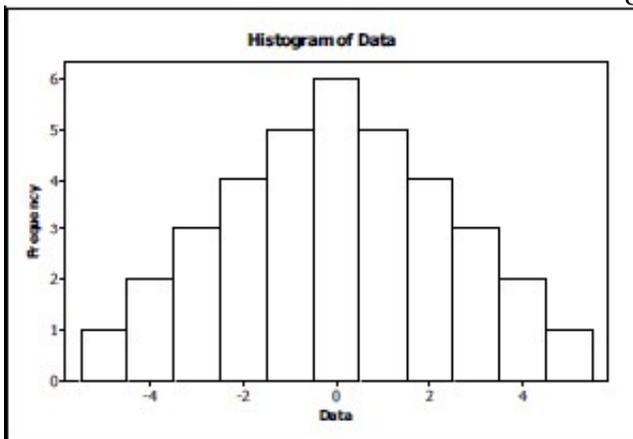
Put your answers on the scantrons. When you look for the correct answer, keep it in mind that it may have been rounded off.

- 1) School administrators collect data on students attending the school. 1) _____
Which of the following variables is quantitative?
- A) none of these
 - B) class (freshman, sophomore, junior, senior)
 - C) whether the student has taken the SAT
 - D) grade point average
 - E) whether the student is in AP* classes
- 2) We collect these data from 50 male students. Which variable is 2) _____
categorical?
- A) eye color
 - B) number of TV sets at home
 - C) hours of homework last week
 - D) head circumference
 - E) number of cigarettes smoked daily
- 3) Which of these variables is most likely to be bimodal? 3) _____
- A) eye color
 - B) number of TV sets at home
 - C) hours of homework last week
 - D) number of cigarettes smoked daily
 - E) head circumference
- 4) Which of these variables is most likely to follow a Normal model? 4) _____
- A) number of cigarettes smoked daily
 - B) number of TV sets at home
 - C) head circumference
 - D) hours of homework last week
 - E) eye color

5) The advantage of making a stem-and-leaf display instead of a dotplot is 5) _____ that a stem-and-leaf display

- A) is for quantitative data, while a dotplot shows categorical data.
- B) preserves the individual data values.
- C) shows the shape of the distribution better than a dotplot.
- D) satisfies the area principle.
- E) none of these

6) Which is true of the data shown in the histogram? 6) _____

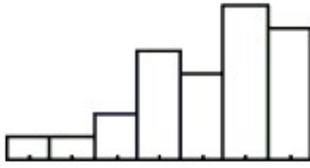


- I. The distribution is approximately symmetric.
- II. The mean and median are approximately equal.
- III. The median and IQR summarize the data better than the mean and standard deviation.

- A) I and III
- B) III only
- C) I, II, and III
- D) I and II
- E) I only

7) Which is true of the data shown in the histogram?

7) _____



- I. The distribution is skewed to the right.
- II. The mean is probably smaller than the median.
- III. We should use median and IQR to summarize these data.

- A) II only
- B) I only
- C) I, II, and III
- D) II and III
- E) III only

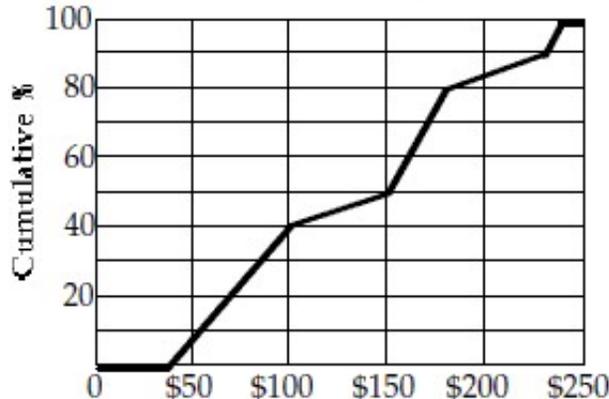
8) Suppose a Normal model describes the number of pages printer ink cartridges last. If we keep track of printed pages for the 47 printers at a company's office, which must be true?

8) _____

- I. The page counts for those ink cartridges will be normally distributed.
- II. The histogram for those page counts will be symmetric.
- III. 95% of those page counts will be within 2 standard deviations of the mean.

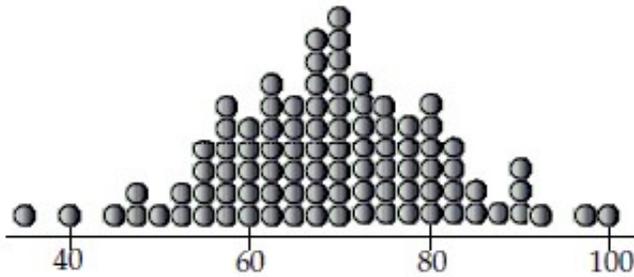
- A) II only
- B) none of these
- C) I, II, and III
- D) I only
- E) II and III

- 9) The veterinary bills for the dogs are summarized in the ogive shown. Estimate the IQR of these expenses. 9) _____



- A) \$100
 - B) \$75
 - C) \$200
 - D) \$50
 - E) \$150
- 10) Two sections of a class took the same quiz. Section A had 15 students who had a mean score of 80, and Section B had 20 students who had a mean score of 90. Overall, what was the approximate mean score for all of the students on the quiz? 10) _____
- A) none of these
 - B) 85.7
 - C) 84.3
 - D) It cannot be determined.
 - E) 85.0

- 11) The standard deviation of the data displayed in this dotplot is most likely 11) _____ to be ...



- A) 8.
 B) 18.
 C) 20.
 D) 5.
 E) 12.
- 12) The five-number summary of credit hours for 24 students in a statistics class is: 12) _____

Min	Q1	Median	Q3	Max
13.0	15.0	16.5	18.0	22.0

Which statement is true?

- A) none of these
 B) There are both low and high outliers in the data.
 C) There is at least one high outlier in the data.
 D) There are no outliers in the data.
 E) There is at least one low outlier in the data.
- 13) If we want to discuss any gaps and clusters in a data set, which of the following should not be chosen to display the data set? 13) _____
- A) dotplot
 B) Any of these would work.
 C) histogram
 D) boxplot
 E) stem-and-leaf plot

- 14) Suppose that a Normal model describes the acidity (pH) of rainwater, and that water tested after last week's storm had a z-score of 1.8. This means that the acidity of that rain ... 14) _____
- A) varied with a standard deviation of 1.8
 - B) had pH of 1.8.
 - C) had pH 1.8 higher than avg, rainfall.
 - D) had pH 1.8 times that of average rainwater.
 - E) had pH 1.8 standard deviations higher than average rainwater.
- 15) Which of the following summaries are changed by adding a constant to each data value? 15) _____
- I. the mean
 - II. the median
 - III. the standard deviation
- A) I, II, and III
 - B) III only
 - C) I only
 - D) I and II
 - E) I and III

Questions 16 - 17 are based on the following information:

Cats and dogs The table shows whether students in an introductory statistics class like dogs and/or cats.

		Like Dogs		
		Yes	No	Total
Like Cats	Yes	194	21	215
	No	110	10	120
	Total	304	31	335

- 16) What is the marginal frequency (in %) of "liking dogs"? 16) _____
- A) 90.2%
 - B) 91.7%
 - C) 9.3%
 - D) 90.7%
 - E) 64.2%
- 17) What is the conditional frequency (in %) of "liking dogs" for students who like cats? 17) _____
- A) 90.2%
 - B) 91.7%
 - C) 9.3%
 - D) 90.7%
 - E) 64.2%

Questions 18 - 22 are based on the following information:

Copy machines A manufacturer claims that lifespans for their copy machines (in months) can be described by a Normal model $N(42,7)$.

- 18) A company with a several large office buildings buys 200 of these copiers. The salesman tells the boss "190 (95%) of your new copiers will last between 28 and n months." What is n? 18) _____
- A) 35
 - B) 42
 - C) 49
 - D) 56
 - E) 63
- 19) What is the 3rd quartile of copier lifespans? 19) _____
- A) 37.3
 - B) 42
 - C) 46.7
 - D) 49
 - E) 56
- 20) What percent of the copiers are expected to fail before 36 months? 20) _____
- A) 15.9%
 - B) 19.6%
 - C) 25%
 - D) 28.4%
 - E) 38.8%

- 21) The manufacturer wants to reduce the 36-month failure rate to only 10%. 21) _____
Assuming the standard deviation will stay the same, what mean lifespan must they achieve?
- A) 39.2 months
 - B) 42 months
 - C) 43.9 months
 - D) 45.0 months
 - E) 50.1 months
- 22) A competing manufacturer says that not only will 90% of their copiers 22) _____
last at least 36 months, 65% will last at least 42 months. What Normal model parameters is that manufacturer claiming?
- A) $N(40.1, 6.2)$
 - B) $N(42, 7)$
 - C) $N(42.9, 5.8)$
 - D) $N(43.2, 7.3)$
 - E) $N(44.6, 6.7)$

- 23) All but one of these statements contain a mistake. Which could be true? 23) _____
- A) The correlation between a football player's weight and the position he plays is 0.54.
 - B) The correlation between a car's length and its fuel efficiency is 0.71 miles per gallon.
 - C) The correlation between the amount of fertilizer used and the yield of beans is 0.42.
 - D) There is a high correlation (1.09) between height of a corn stalk and its age in weeks.
 - E) There is a correlation of 0.63 between gender and political party.
- 24) A correlation of zero between two quantitative variables means that 24) _____
- A) there is no association between the two variables.
 - B) there is no linear association between the two variables.
 - C) we have done something wrong in our calculation of r .
 - D) re-expressing the data will guarantee a linear association between the two variables.
 - E) none of these
- 25) Two variables that are actually not related to each other may nonetheless 25) _____ have a very high correlation because they both result from some other, possibly hidden, factor. This is an example of
- A) a lurking variable.
 - B) leverage.
 - C) extrapolation.
 - D) an outlier.
 - E) regression.