

STAT 31 Practice Midterm 1
Fall 2005

INSTRUCTIONS: BOTH THE EXAM AND THE BUBBLE SHEET WILL BE COLLECTED. YOU MUST PRINT YOUR NAME AND SIGN THE HONOR PLEDGE ON THE BUBBLE SHEET. YOU MUST BUBBLE-IN YOUR NAME & YOUR STUDENT IDENTIFICATION NUMBER.

EACH QUESTION HAS ONLY ONE CORRECT CHOICE (decimals may need rounding). USE "NUMBER 2" PENCIL ONLY - DO NOT USE INK - FILL BUBBLE COMPLETELY. NO NOTES OR REMARKS ARE ACCEPTED - DO NOT TEAR OR FOLD THE BUBBLE SHEET.

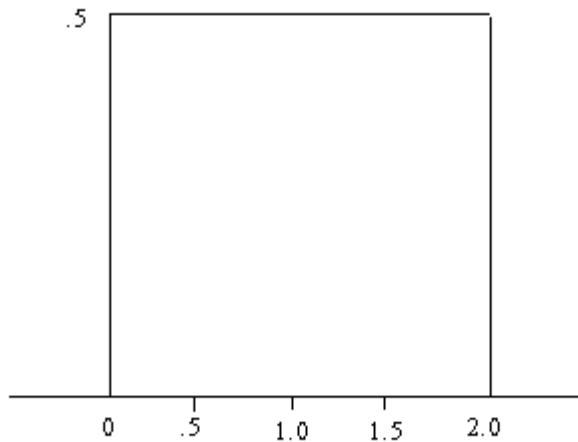
A GRADE OF ZERO WILL BE ASSIGNED FOR THE ENTIRE EXAM IF THE BUBBLE SHEET IS NOT FILLED OUT ACCORDING TO THE ABOVE INSTRUCTIONS.

1. This is a standard deviation contest. Which of the following sets of four numbers has the largest possible standard deviation?
 - A) 7, 8, 9, 10
 - B) 5, 5, 5, 5
 - C) 0, 0, 10, 10
 - D) 0, 1, 2, 3

2. What interval (on the horizontal axis) corresponds to the middle 50% of area under the standard Normal density curve?
 - A) (-0.5, 0.5)
 - B) (-0.25, 0.25)
 - C) (0.4017, 0.5987)
 - D) (-0.67, 0.67)

3. A stemplot of a set of data is roughly symmetric, but the data do not even approximately follow the 68-95-99.7 rule. We conclude that the data are
 - A) normal, but they are not standard normal.
 - B) standard normal.
 - C) not normal.
 - D) normal.

4. Which of the following is likely to have a mean that is smaller than the median?
- A) The salaries of all National Football League players.
 - B) The scores of students (out of 100 points) on a very easy exam in which most score perfectly, but a few do very poorly.
 - C) The prices of homes in a large city.
 - D) The scores of students (out of 100 points) on a very difficult exam on which most score poorly, but a few do very well.
5. Use the following density curve to answer the question below.



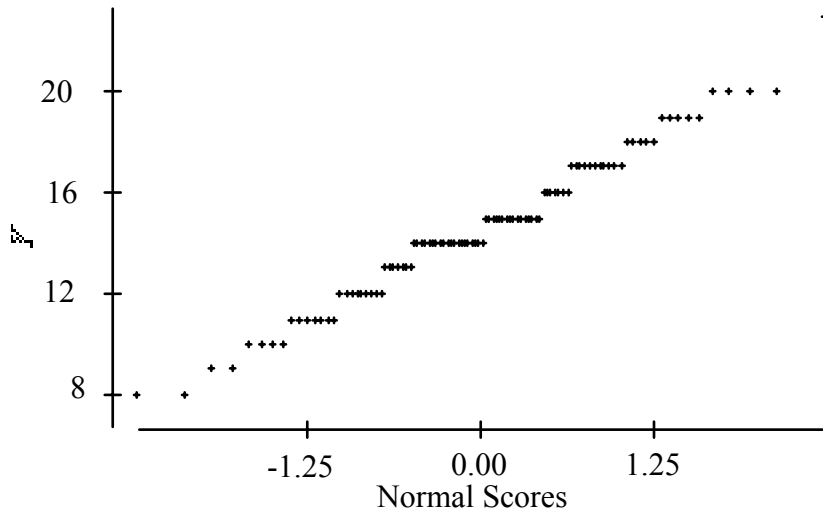
- For this density curve, what percent of the observations lie between 0.25 and 1.2?
- A) 25%
 - B) 47.5%
 - C) 52.5%
 - D) 95%

6. A sample was taken of the salaries of 20 employees of a large company. The following are the salaries (in thousands of dollars) for this year. For convenience, the data are ordered.

28	31	34	35	37	41	42	42	42	47
49	51	52	52	60	61	67	72	75	77

According to corporate policy, every employee will receive a 5% pay increase every year. This year the company performs really well. The CEO decides that each employee in the company will receive a \$3000 raise for next year (each employee's salary is increased by \$3000) in addition to the regular 5% pay increase. The standard deviation of the salaries for the employees will

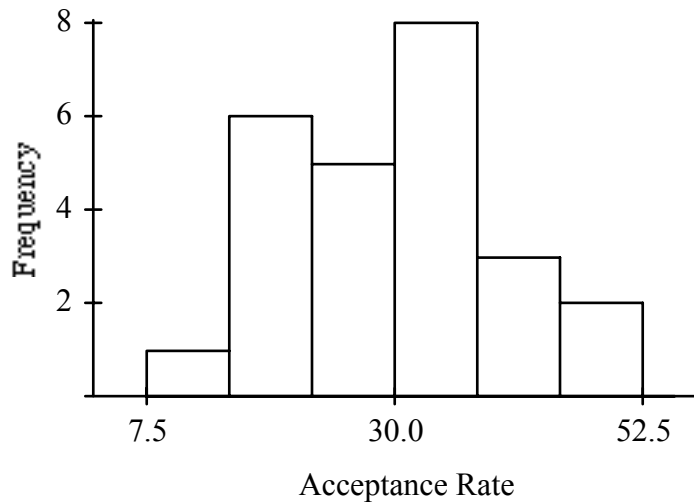
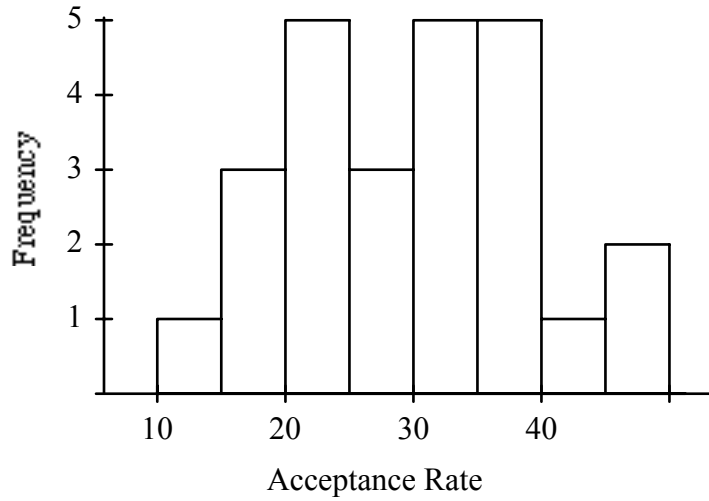
- A) be unchanged.
 - B) increase by 5%.
 - C) be multiplied by 5%.
 - D) change, but none of the above is true.
7. Consider the following normal quantile plot.



- The most striking feature of the plot is
- A) the granularity.
 - B) the strong skewness indicated by the plot.
 - C) the many outliers evident in the plot.
 - D) the fact that Y is categorical.

8. The mean cholesterol levels of ten men who visited a cholesterol screening clinic located in the downtown area is 250. The nurse later found out that one of the men's cholesterol level should be 230, but was mistakenly recorded as 280. After correcting this recording error, the mean cholesterol level in this sample is
- A) 255
 - B) 240
 - C) 245
 - D) impossible to calculate

9. Each of the following two histograms represents the distribution of acceptance rates (percent accepted) among 25 business schools in 1995. The histograms use different intervals, but are based on the same data. In each interval, the left endpoint is included but not the right.



What percent of the schools have an acceptance rate of under 20%?

- A) 3%
- B) 4%
- C) 12%
- D) 16%

10. The Insurance Institute for Highway Safety publishes data on the total damage suffered by compact automobiles in a series of controlled, low-speed collisions. A sample of the data in dollars, with brand names removed, is

950 650 850 750

The interquartile range of the above data is

- A) 300.
B) 200.
C) 400.
D) none of the above.
11. A reporter wishes to portray baseball players as overpaid. Which measure of center should he report as the average salary of major league players?
A) The mean.
B) The median.
C) Either the mean or median. They will be equal in this case.
D) Neither the mean nor the median. Both will be much lower than the actual average salary.
12. The time to complete a standardized exam is approximately normal with a mean of 70 minutes and a standard deviation of 10 minutes. Using the 68-95-99.7 rule, what percentage of students will complete the exam in under an hour?
A) 68%
B) 32%
C) 16%
D) 5%
13. A local small business has 30 workers, $\frac{2}{3}$ of which are female. The average salary of all female workers is \$40,000. The average salary of all male workers is \$45,000. What must be true about the average salary of all workers?
A) It must be \$42,500.
B) It must be larger than the median salary.
C) It could be any number between \$40,000 and \$45,000.
D) It must be smaller than \$42,500.

14. A set of data has a median that is much larger than the mean. Which of the following statements is most consistent with this information?
- A) A stemplot of the data is symmetric.
 - B) A stemplot of the data is skewed left.
 - C) A stemplot of the data is skewed right.
 - D) The data set must be so large that it would be better to draw a histogram than a stemplot.
15. A soft-drink machine can be regulated so that it discharges an average of μ ounces per cup. If the ounces of each discharge are normally distributed with a standard deviation of 0.4 oz. what value should μ be set at so that 6-oz. cups will overflow only 2.5% of the time?
- A) 6.82
 - B) 6.78
 - C) 5.18
 - D) 5.22
16. A company produces packets of soap powder which are labeled "Giant Size 32 oz." The actual weight of soap powder in a box has a normal distribution with a mean of 33 oz. and a standard deviation of 0.7 oz. 95% of packets actually contain more than x ounces of soap powder. What is x ?
- A) 34.40
 - B) 34.15
 - C) 31.85
 - D) 31.60
17. The weights of packets of cookies produced by a certain manufacturer have a normal distribution with a mean of 202 g and a certain standard deviation. It is stamped on the packet that only 2.5% of the packets are lighter than 196 g. The standard deviation is
- A) 1.85 g.
 - B) 3 g.
 - C) 3.65 g.
 - D) not enough information to tell.
18. A sample of five recent births at a local hospital yielded a mean birthweight (in ounces) of 125 and a sample standard deviation of 25. A sixth baby has a birthweight of exactly 125. After including the sixth baby, the sample standard deviation is
- A) 22
 - B) 23
 - C) 25
 - D) 26

19. Scores on an IQ test are normally distributed with a mean of 100 and a standard deviation of 15.

What is the IQR of the IQ score?

- A) 10.
- B) 110.
- C) 20.
- D) 90.

Answer Key

1. C
2. D
3. C
4. B
5. B
6. B
7. A
8. C
9. D
10. B
11. A
12. C
13. D
14. B
15. D
16. C
17. B
18. A
19. C