Requirements for Unit 1 Reassessment

TEST MUST BE TAKEN BY OCTOBER 3rd

1. The dot plot below displays the total number of miles that the 28 residents of one street in a certain community traveled to work in one five-day workweek.

Which of the following is closest to the percentile rank of a resident from this street who traveled 85 miles to work that week?

- a) 60
- b) 70
- c) 75
- d) 80
- e) 85

2. The scores on a statistics test had a mean of 81 and a standard deviation of 9. One student was absent on the test day, and his score wasn’t included in the calculation. The teacher made a mistake (not likely) while grading, so an additional 5 points was added to every test grade. What would happen to the mean and standard deviation?

- a) Mean will increase, and standard deviation will increase
- b) Mean will increase, and standard deviation will decrease
- c) Mean will decrease, and standard deviation will decrease
- d) Mean will increase, and standard deviation will stay the same
- e) Both will remain the same

3. The stemplot shows the number of home runs hit by each of the 30 Major League Baseball teams in 2011. Home run totals above what value should be considered outliers?

- a) 175
- b) 210
- c) 222
- d) 229
- e) 257

Key 14 8 is a team with 148 home runs

4. The graph below shows the cumulative proportions plotted against grade point averages for a large public high school.

4a) What is the median grade point average?

- a) 0.8
- b) 2.0
- c) 2.4
- d) 2.5
- e) 2.6

4b) What is the interquartile range?

- a) 1.0
- b) 1.8
- c) 2.4
- d) 2.8
- e) 4.0
5. The histogram represents the data collected when the professor, on day one, asked a statistics class with 136 students, how much money (in dollars) each student has in his or her possession.

5a) The percentage of students with less than $10 in their possession is closest to
   a) 30%    b) 35%    c) 45%    d) 60%    e) 70%

5b) Which of the following statements about this distribution is not correct?
   a) The histogram is skewed right.
   b) The median is less than $20.
   c) The IQR is $35
   d) The mean is greater than the median
   e) The histogram is unimodal.

6. Which of the following statements are true?
   I. Both sets have the same mean.
   II. Both sets have the same variance.
   III. Set A has a larger standard deviation than Set B.

   a) I only    b) II only    c) III only
   d) I and II  e) I and III

7. A Random sample of 25 households from the Mountainview School District was surveyed. In this survey, data were collected on the age of the youngest child living in each household. The histogram below displays the data collected in the survey.

   In which of the following interval is the median located?
   a) 0 years old to less than 2 years old
   b) 4 years old to less than 6 years old
   c) 6 years old to less than 8 years old
   d) 8 years old to less than 10 years old
   e) 10 years old to less than 12 years old

8. The National Assessment of Educational Progress administered a State Assessment which calculated a state by state mathematics proficiency score for students in eighth grade. The resulting boxplot is

   Which of the following statements are true?
   I. The state score 273 has a percentile rank of 75.
   II. The mean state score is 267.
   III. The lowest state score is 246.

   a) III only    b) I and II    c) I and III    d) II and III    e) I, II and III
9. Without using your calculator, examine the following data sets. Which of the following sets of four numbers has the largest standard deviation?

   a)  7, 8, 9, 10  
   b)  5, 5, 5, 5  
   c)  0, 0, 10, 10  
   d)  0, 1, 2, 3

10. The median age of five people in a room is 30 years. One of the people, whose age is 50 years, leaves the room. The median age of the remaining four people in the room

   a. is 40
   b. is 30
   c. is 20
   d. cannot be determined from the information

11. In which of the situations listed would a histogram be an appropriate display of data?

   I. The data are categorical
   II. The data are quantitative
   III. The data are discrete
   IV. The data are continuous

   a. I only  
   b. II and III only  
   c. II and IV only  
   d. II, III and IV only  
   e. I, II, III, and IV

12. A histogram of the educational level (in number of years of schooling) of the adult population of the United States would have which of the following characteristics?

   I. Symmetry
   II. Clusters
   III. Skewness to the left

   a. II only  
   b. I and II  
   c. I and III  
   d. II and III  
   e. I, II, and III

13. The back-to-back stem-and-leaf plot below gives the percentage of students who dropped out of school at each of the 49 high schools in a large metropolitan school district.

   School Year 1989-1990
   0 4
   9 9 9 8 8 7 0 5 6 6 6 7 7 7 8 8 8 9 9
   4 4 4 4 3 3 2 2 2 2 1 1 1 1 0 1 0 0 0 1 1 1 1 2 2 2 3 3 4 4 4 4
   9 9 9 7 7 6 6 6 6 6 5 1 5 5 5 6 6 6 6 7 7 7 7 8
   4 2 2 2 1 0 0 2 1 3
   8 8 8 7 6 2
   2 3 0 1 1 2
   7 6 6 3 5

   School Year 1992-1993

   1| 2  12%

Which of the following statements is NOT justified by these data?

   a) The drop-out rate decreased in each of the 49 high schools between the 1989-1990 and 1992-1993 school years.
   b) For the school years shown, most students in the 49 high schools did not drop out of high school.
   c) In general, drop-out rates decreased between the 1989-1990 and 1992-1993 school years.
   e) The spread between the schools with the lowest drop-out rates and those with the highest drop-out rates did not change much between the 1989-1990 and 1992-1993 school years.
14. There are three children in a room, ages 3, 4, and 5. If a four-year old child enters the room, what is the mean and standard deviation for each scenario? (with proper notation)

15. Which of the following data is quantitative or categorical?
   a. Heights of students in your class
   b. Colors of the vehicles in the school parking lot
   c. Ages of major league baseball players
   d. Number of pets in each household in a neighborhood
   e. Scores on a final exam

16. All students in the physical education class completed a basketball free-throw shooting event and the highest number of shots made was 32. The next day a student who had just transferred into the school completed the event, making 35 shots. Indicate whether adding the new student’s score to the rest of the data made each of these summary statistics increase, decrease, or stay about the same.
   a. mean
   b. median
   c. range
   d. IQR
   e. standard deviation

17. The students in a biology class kept a record of the height (in centimeters) of plants for a class experiment.
   a. Sketch a histogram for the following data:
      
      |   |   |   |   |   |
      |---|---|---|---|---|
      |49 |67 |38 |55 |62 |
      |54 |36 |41 |56 |43 |
      |49 |75 |44 |60 |48 |
      |52 |48 |53 |59 |32 |

   b. Find the mean and standard deviation of the plant heights (include proper notation).

   c. Is it appropriate to use the mean and standard deviation to summarize these data? Explain.

   d. Describe the distribution of plant heights.
18. a) **Question:** Describe Center, Unusual Features, Spread, and Shape of the boxplot. CUSS!

b) **Question:** Approximately, what proportion of students had M&M’s with bag weighing more than the advertised amount?

c) **Question:** Approximately, what proportion of the students had M&M’s with bag weighing less than 1.75 oz?

d) **Question:** Roughly, 1 gram is approximately 1/13 of an ounce OR 13 grams is about 1 ounce. Convert the median M&M’s weight from ounces to grams. (NEXT 3 ARE TRANSFORMATION QUESTIONS)

e) **Question:** If the IQR is .11 ounces, what would be the new IQR if units were changed from ounces to grams?

f) **Question:** Suppose a store charges $0.30 per ounce of M&M’s. What is the median cost of a bag of M&M’s?
19. During the early part of the 1994 baseball season, many sports fans and baseball players noticed that the number of home runs being hit seemed to be unusually large. Below are the team-by-team statistics on home runs hit through Friday, June 3, 1994 (from the Columbus Dispatch Sports Section, Sunday, June 5, 1994).

American League: 35, 40, 43, 49, 51, 54, 57, 58, 58, 64, 68, 68, 75, 77
National League: 29, 31, 42, 46, 47, 48, 48, 53, 55, 55, 55, 63, 63, 67

a) Construct an appropriate graph for comparing the number of home runs hit in the two leagues.

b) Calculate the numerical summaries (the 5 number summaries as well as the mean and standard deviation) of the number of home runs hit for each of the two leagues.

c) Write a few sentences comparing the distributions of home runs in the two leagues.

d) Would the mean or the median be the most appropriate number to use to describe a typical number of home runs for each league? Explain.

e) Are there any outliers in either of the two data sets? Justify your answer numerically.
20. Two parents have each built a toy catapult for use in a game at an elementary school fair. To play the game, students will attempt to launch Ping-Pong balls from the catapults so that the balls land within a 5-centimeter band. A target line will be drawn through the middle of the band, as shown in the figure below. All points on the target line are equidistant from the launching location.

If a ball lands within the shaded band, the student will win a prize.

The parents have constructed the two catapults according to slightly different plans. They want to test these catapults before building additional ones. Under identical conditions, the parents launch 40 Ping-Pong balls from each catapult and measure the distance that the ball travels before landing. Distances to the nearest centimeter are graphed in the dotplots below.

![Diagram of a toy catapult with a target line and a band]

a) Comment on any similarities and any differences in the two distributions of distances traveled by balls launched from catapult A and catapult B.

b) If the parents want to maximize the probability of having the Ping-Pong balls land within the band, which one of the two catapults, A or B, would be better to use than the other? Justify your choice.

c) Using the catapult that you chose in part (b), how many centimeters from the target line should this catapult be placed? Explain why you chose this distance.