AP Statistics Name_____
Unit 01 – Univariate Data
Chapter 2 Practice

1. How many pairs of shoes do students have? Do girls have more shoes than boys? Here are data from a random sample of 20 female and 20 male students at a large high school:

Female	50	26	26	31	57	19	24	22	23	38
	13	50	13	34	23	30	49	13	15	51
Male	14	7	6	5	12	38	8	7	10	10
	10	11	4	5	22	7	5	10	35	7

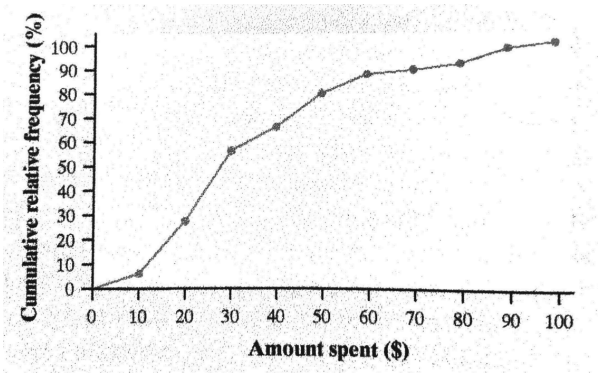
   a. Find and interpret the percentile in the female distribution for the girl with 22 pairs of shoes.

   b. Find and interpret the percentile in the male distribution for the boy with 22 pairs of shoes.

   c. Who is more unusual: the girl with 22 pairs of shoes or the boy with 22 pairs of shoes? Explain.

   d. Create a back-to-back stem-and-leaf plot of the data.

2. The figure below is a cumulative relative frequency graph of the amount spent by 50 consecutive grocery shoppers at a store.

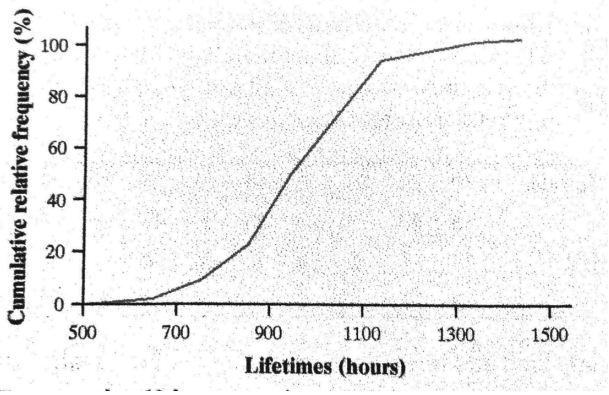


   a. Estimate the interquartile range of this distribution. Show your method.

   b. What is the percentile for the shopper who spent $19.50?

   c. Draw the histogram that corresponds to this graph.

3. The graph below is a cumulative relative frequency graph showing the lifetimes (in hours) of 200 lamps.



   a. Estimate the 60th percentile of this distribution. Show your method.

   b. What is the percentile for a lamp that lasted 900 hours?

c. Draw a histogram that corresponds to this graph.

4. The scores on Mrs. De Marre's statistics quiz had a mean of 12 and a standard deviation of 3. Mrs. De Marre wants to transform the scores to have a mean of 75 and a standard deviation of 12. What transformations should she apply to each test score? Explain.

5. Mrs. De Marre uses an unusual grading system in her class. After each test, she transforms the scores of have a mean of 0 and a standard deviation of 1. Mrs. De Marre then assigns a grade to each student based on the transformed score. On her most recent test, the class's scores had a mean of 68 and a standard deviation of 15. What transformations should she apply to each test score? Explain.

6. A school system employs teachers at salaries between $28,000 and $60,000. The teachers' union and the school board are negotiating the form of next year's increase in the salary schedule.

    a. If every teacher is given a flat $1000 raise, what will this do to the mean salary? To the median salary? Explain your answers.

b. What would a flat $1000 raise do to the extremes and quartiles of the salary distribution? To the standard deviation of teachers' salaries? Explain your answers.

c. If each teacher receives a 5% raise instead of a flat $1000 raise, the amount of the raise will vary from $1400 to $3000, depending on the present salary.

   i. What will this do to the mean salary? To the median salary? Explain your answers.

   ii. Will a 5% raise increase the IQR? Will it increase the standard deviation? Explain your answers.

7. What percent of a standard Normal model is found in each region? Be sure to draw a picture first.

   a. $z > 1.5$ b. $z < 2.25$ c. $-1 < z < 1.15$

8. In a standard Normal model, what value(s) of z cut(s) off the region described? Don't forget to draw a picture.
    a. The highest 20%
    c. The lowest 3%
    b. The highest 75%
    d. The middle 90%

9. Based on the Normal model N(100, 16) describing IQ scores, what percent of people's IQs would you expect to be:
    a. Over 80?
    b. Under 90?
    c. Between 112 and 132?

10. Based on the Normal model N(100, 16) describing IQ scores,

    a. What IQ represents the 15th percentile?

    b. What IQ represents the 98th percentile?

    c. What's the IQR of the IQs?