

Text Exercise Set 3

NAME:

3-1 In Exercise 2-5, the total number of dairy product sales at each store in a chain of convenience stores is recorded as follows:

27 23 35 44 29 32 23 42 30 25 39 47 34 44 33 41 44 28 29 37 48 20 26 34 31 43 47

If we were going to construct a frequency distribution for the data displayed in Exercise 2-5, decide whether it would be better to list individual values or to define classes, and explain your answer.

3-2 In Exercise 2-6, the total number of sales by each salesman in a particular office is recorded as follows:

9 15 14 7 10 9 11 10 17 8 9 12 15 8 10 13 17 10 15 11 14
17 15 7 15 10 9 10 11 14 8 11 8 7 12 15 13 11 17 14 11 13

If we were going to construct a frequency distribution for the data displayed in Exercise 2-6, decide whether it would be better to list individual values or to define classes, and explain your answer.

3-3 For each the frequency distributions described, indicate whether or not cumulative frequencies would be appropriate, and state why or why not.

- (a) The highest academic degree earned (No Degree, High School Degree, Associate's Degree, Bachelor's Degree, Master's Degree, Doctoral Degree) is recorded for each of 200 residents of a city and organized into a frequency distribution.

- (b) The temperatures at noon on a particular day for each of 200 cities is organized into a frequency distribution.

- (c) Which of three candidates for mayor a voter intends to vote for in an upcoming election is recorded for each of 200 voters of a city and organized into a frequency distribution.

- 3-4** For each the frequency distributions described, indicate whether or not cumulative frequencies would be appropriate, and state why or why not.
- (a) The race (White, Hispanic, Black, Asian, Other) is recorded for each of 200 residents of a city and organized into a frequency distribution.
 - (b) The age in years of each car that passes a particular intersection during a designated three-hour time period is recorded, and these observations are organized into a frequency distribution.
 - (c) Which of the 10 stores in shopping center a shopper spends the most time in is recorded for each of 200 shoppers and organized into a frequency distribution.
 - (d) Each of 200 residents of a city are classified into one of four categories depending on how often they ride the city busses (never, occasionally, one or two days a week, almost every day or every day), and the data is organized into a frequency distribution.

3-5 Suppose we define the variable "Income Class" to be a qualitative variable with three categories: lower class, middle class, and upper class. Lower class is defined to include anyone with a yearly income below \$40,000, middle class is defined to include anyone with a yearly income which is \$40,000 or more but still below \$60,000, and upper class is defined to include anyone with a yearly income which is \$60,000 or more. The observations of yearly income (\$1000s) for the 30 individuals in the SURVEY DATA, displayed as Data Set 1-1 at the end of Unit 1, are as follows:

34 28 71 35 55 75 26 30 27 53 45 34 30 78 68
29 40 39 60 49 39 33 65 25 61 41 44 45 64 39

- (a) Construct a frequency distribution displaying the distribution of "Income Class" with raw and relative frequencies.

3-5 - continued

- (b) In space provided below, construct a bar chart displaying the distribution of "Income Class".
- (c) In space provided below, construct a pie chart displaying the distribution of "Income Class".

Bar Chart for Income Class

Pie Chart for Income Class

- (d) Explain why "Income Class" could be treated as a qualitative-ordinal variable.
- (e) Would it have been appropriate to include cumulative frequencies with the frequency distribution constructed in part (a)? Why or why not?

3-6 Suppose we define the variable "Television Viewing" as a qualitative variable with three categories: little, moderate, and excessive. Little is defined to include those watching 10 or fewer hours of TV per week, moderate is defined to include those watching more than 10 but not more than 20 hours of TV per week, and excessive is defined to include those watching more than 20 hours of TV per week. The observations of weekly TV hours for the 30 individuals in the SURVEY DATA, displayed as Data Set 1-1 at the end of Unit 1, are as follows:

15 20 18 12 14 11 10 12 8 21 12 8 11 18 17
8 9 8 27 9 6 11 14 5 15 8 10 10 13 9

- (a) Construct a frequency distribution displaying the distribution of "Television Viewing" with raw and relative frequencies.

3-6 - continued

- (b) In space provided below, construct a bar chart displaying the distribution of "Television Viewing".
- (c) In space provided below, construct a pie chart displaying the distribution of "Television Viewing".

Bar Chart for Television Viewing

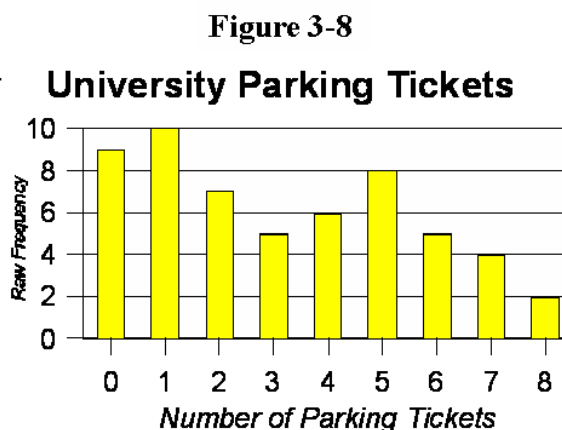
Pie Chart for Television Viewing

- (d) Explain why "Television Viewing" could be treated as a qualitative-ordinal variable.
- (e) Would it have been appropriate to include cumulative frequencies with the frequency distribution constructed in part (a)? Why or why not?

3-7 Make up an ordered array of 10 observations so that a box plot of the data will display a

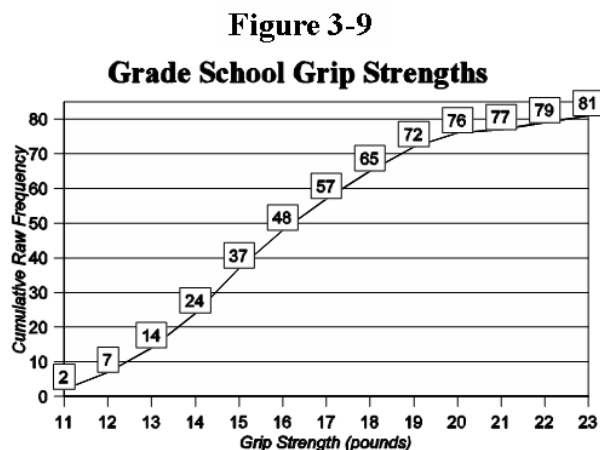
- (a) symmetric distribution;
- (b) negatively skewed distribution;
- (c) positively skewed distribution.

3-8 Because a university is located in the center of a city, parking has always been a problem for students. At the end of the last academic year, several graduating seniors were asked how many parking tickets they received during the previous academic year, and the results of the survey are summarized in the histogram of Figure 3-8. Use this histogram to answer the questions.



- (a) What was the total number of seniors interviewed?
- (b) How many seniors received at least five parking tickets?
- (c) What percentage of seniors received no parking tickets?
- (d) What percentage of seniors received fewer than three tickets?

3-9 Grip strengths measured in pounds of force are rounded to the nearest integer and recorded for several grade school children. The ogive of Figure 3-9 (with labels at each point to allow for easier reading) is constructed from the data. Use this ogive to answer the questions.



- (a) What was the total number of school children?
- (b) For how many children was the grip strength recorded as 17 lbs.?
- (c) For how many children was the grip strength recorded as less than or equal to 15 lbs.?
- (d) For what percentage of the children was the grip strength recorded as greater than or equal to 15 lbs.?

3-10 In a survey of city residents, each respondent is asked to state the highest level of education completed. The partially completed frequency table displayed contains the results of the survey. Complete the frequency table.

Highest Degree	Raw Frequency	Relative Frequency	Cumulative Raw Frequency	Cumulative Relative Frequency
No Degrees	78		78	
High School Degree			190	
Associate's Degree	76			
Bachelor's Degree		32.6%		
Master's Degree				96.2%
Doctoral Degree			500	