

Lab for Sections 15.1 and 15.2

Use good notation and show appropriate work.
State your solutions to problems in complete sentences.

Name _____

1. Consider the following set of raw data. The data represents the percentage earned on an exam by 40 students.

93, 84, 87, 52, 76, 23, 98, 83, 86, 64, 68, 72, 83, 64, 57, 91, 75, 83, 46, 73
59, 68, 93, 84, 85, 79, 62, 50, 76, 80, 58, 96, 67, 62, 83, 77, 33, 85, 63, 88

- (a) Construct a stem-and-leaf diagram

- (b) Construct a grouped data frequency and relative frequency table.

class limits	class boundaries	class frequency	relative frequency

- (c) Draw the histogram associated with the above frequency table.

2. The following statement appeared in the 4/27/06 issue of Advocate, “By graduation, the average MSUM senior this year will have accumulated \$23,360 in debt.” There are several questions that need to be answered before this statement can be interpreted correctly. What are those questions?

3. In order to determine how American college students feel about a proposed national law that would tax monies received from grants and scholarships, a survey was conducted. Four hundred undergraduate students at Minnesota State University Moorhead were interviewed. Each of the four interviewers hired to conduct the survey was told to interview 25 freshman, 25 sophomores, 25 juniors and 25 seniors. Of the 400 students interviewed, 10% were in favor of the tax, 85% were opposed and 5% had no opinion.
 - (a) What is the population for this survey? (b) What is the sample for this survey?

 - (c) Is the 10% of the students in favor of the tax a parameter, a statistical value, or neither?

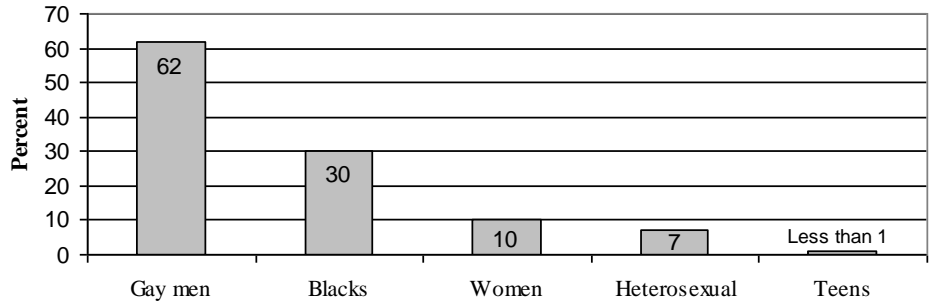
 - (d) Based on these results, how many of Concordia’s 2000 students would favor the tax? Would you expect this number to be more or less than the actual number? Explain.

 - (e) What, if any, bias does this survey have? Explain.

4. Deceptive and Misleading Graphs.
 - (i) What is misleading about the following charts and graphs? If the graph misrepresents the intended information, explain why and state how the graph should be constructed to improve its clarity. Try to identify more than one weakness for each graph. Each graph may have several aspects that are poor—missing labels, viewpoints, lacking information, presentation, etc.
 - (ii) Also, consider whether each graph satisfies the various advantages of graphs and avoids the disadvantages. For example, identify the main feature/s the author of the graph is attempting to emphasize. What information or idea does the author want you to obtain?

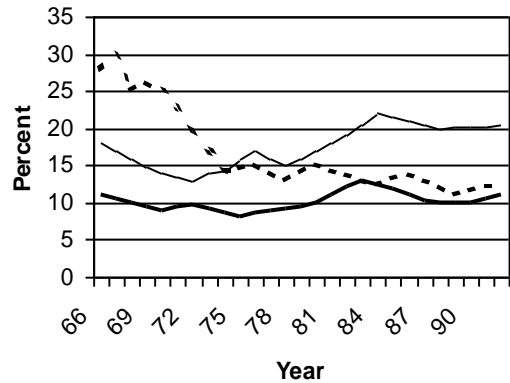
(a) What is the problem with the following graph?

Percentage of those with AIDS who are ...



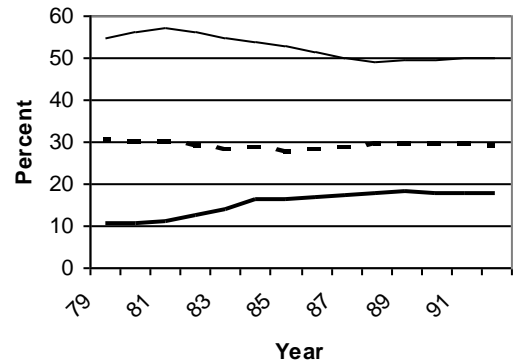
(b) The following two graphs were printed next to each other in the same news article. What is the universe (sample space) for each graph? (I.e., what does a percentage mean in each case?) What is misleading about the graphs when taken together?

Poverty Rates by Age



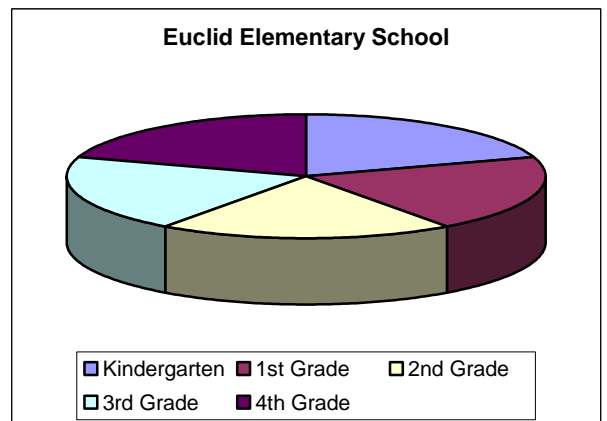
— 18 to 64 — Under 18 - - - Over 64

Poverty Rates by Race



— Hispanic
- - - Black
— White, Non-Hispanic

(c) For this pie chart (circle graph), what is being compared at Euclid Elementary School? Which class is the smallest? How much larger is the largest class than the smallest? What is misleading about the graph?



5. A small business with 12 employees reports an “average” salary of \$25,000. Some additional employees will be hired. In each of the following cases determine the new “average” salary if average refers to (i) mean, (ii) median, (iii) mode, and (iv) midrange.

(a) Suppose three new employees are hired at salaries of \$20,000, \$20,000, and \$25,000.

(i) mean.

(ii) median.

(iii) mode.

(iv) midrange.

(b) Suppose two new employees are hired at salaries of \$20,000 and \$25,000.

(i) mean.

(ii) median.

(iii) mode.

(iv) midrange.