1. Ch 2 Problem 6
   Total: 5 points
   From solution manual:


   Who and what: 2 point
   When and where: 1 point
   How and why: 1 point
   Variable: 1 point

   Note: If the students consider types of iron as an implied variable, it is fine.

2. Ch 2 Problem 18
   Total: 5 points
   From solution manual:

   18. Age and party. Who – 1180 Americans. What – Region, age (in years), political affiliation, and whether or not the person voted in the 1998 midterm Congressional election. When – First quarter of 1999. Where – United States. Why – The information was gathered for presentation in a Gallup public opinion poll. How – Phone Survey. Cases – Each of the 1180 Americans surveyed is an individual in this poll. Variables – There are four variables. Region, political affiliation, and whether or not the person voted in 1998 are categorical variables, and age is a quantitative variable.

   Who and what: 1 point
   When and where: 1 point
   How and why: 1 point

   Note: Students may say the reason why Gallup collected such data is unclear. It is fine. In some way, the purpose of this study is not mentioned.

   Variables: 2 points

3. Ch 3 Problem 3 Table in the news.
   Total: 5 points. 1 point for the table. 1 point for each of the questions below.
   Answers may vary. For some students with difficulties finding a suitable table, we have suggested them with an alternative. Find an article with a bar graph and write down the corresponding frequency table.

   Note that if some students find a two-way table and did not mention this is not a simple frequency table, take 1 point off.

   The students should also answer the following questions:
   1) Is it clearly labeled?
   2) Does it display percentages or counts?
   3) Does the accompanying article tell the W’s of the variable?
   4) Do you think the article correctly interprets the data? Explain.

4. Ch 3 Problem 12
Total: 5 points.

12. Teens and technology II.

The main error is that this is simply the wrong type of display. The percentages of students who use each piece of technology aren’t meant to represent parts of a whole, but rather overlapping categories. A bar chart would be the appropriate display. Even if a pie chart were acceptable, this one has some other problems. The three-dimensional display distorts the percentages. When using technology, always choose the two-dimensional displays. The percentages don’t correspond to the angles of the pie pieces. For example, 85% looks smaller than 67% on the display. To top it all off, the display is unlabeled, giving us no context at all. Appropriate graphs are always self-explanatory.

2 points on “the percentages do not add up to 1” or “the categories overlap”.
2 points on “3D effects do not show the percentages properly”
1 points on “not labeled”

5. Ch 3 Problem 16
Total: 10 points. a)-f) 1 point each. g) 4 points. Graph 3 point. Discussion 1 point.
Note: Students may employ other graphs for display. Such as back-to-back bar graphs as long as it displays the right information.

16. After high school.

<table>
<thead>
<tr>
<th>What graduates did</th>
<th>1959</th>
<th>1970</th>
<th>1980</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing education</td>
<td>197</td>
<td>388</td>
<td>320</td>
<td>905</td>
</tr>
<tr>
<td>Employed</td>
<td>103</td>
<td>137</td>
<td>98</td>
<td>338</td>
</tr>
<tr>
<td>In the military</td>
<td>20</td>
<td>18</td>
<td>18</td>
<td>56</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>58</td>
<td>45</td>
<td>116</td>
</tr>
<tr>
<td>Total</td>
<td>333</td>
<td>601</td>
<td>481</td>
<td>1415</td>
</tr>
</tbody>
</table>

a) 56 graduates joined the military, out of 1415 total graduates. 56/1415 = 4.0%

b) In 1970, 601 students graduated. 601/1415 = 42.5%

c) In 1970, 18 graduates joined the military. 18/601 = 3.0%

d) 18 of the 56 students who joined the military were 1970 graduates. 18/56 = 32.1%

e) Convert the total column to percentages: 64.0% continued education, 23.9% employed, 4.0% in the military, and 8.2% other.

f) Convert the 1959 column to percentages: 59.2% continued education, 30.9% employed, 6.0% in the military, and 3.9% other.

g) There is evidence that the percentage of Ithaca High School graduates continuing their education has increased from 1959 to 1970 to 1980. Likewise, the percentage of students who enter the work force directly after high school appears to have decreased over these years. For example, the percentage of graduates who entered the workforce decreased from 30.9% to 22.8% to 20.4% for the years 1959, 1970, and 1980, respectively.
6. Ch4 Problem 6
Total: 5 points

The distribution of the number of emails received from each student by a professor in a large introductory statistics class during an entire term is skewed to the right, with the number of emails ranging from 1 to 21 emails. The distribution is centered at about 2 emails, with many students only sending 1 email. There is one outlier in the distribution, a student who sent 21 emails. The next highest number was only 8.

“skewed to the right” 1 point
“one mode” 1 point
something about center or peak: 1 point
range: 1 point
outlier: 1 point

7. Ch 4 Problem 16
Total: 10 points. The graphs should be done by hands not by computer.

16. Hurricanes, again.

The distribution of the number of hurricanes per year before 1970 is unimodal and skewed to the right. The center of the distribution is about 2 to 3 hurricanes per year. The number of hurricanes per year ranges from 0 to 7. After 1970, the distribution of the number of hurricanes per year is also unimodal and skewed right, with center around 1 or 2 hurricanes per year. The number of hurricanes per year ranges from 0 to 6. There may be a difference in the number of hurricanes per year before and after 1970. Before 1970, there may have been a slightly greater number of hurricanes in a typical year.

Make the display: 5 points. Students can also employ side-by-side histograms or dotplots.

Describe the distributions and compare. 5 points.