Exam 1 Review

1. The Metropolitan Transit Commission collects information about how Bay Area residents commute to work. A survey was conducted that included 459 Santa Clara County residents who commute to work. Each person in the survey supplied data about what method of transportation he/she uses and the length (in miles) of his/her commute to work. From this data, it was determined that the average commute distance to work is 15 miles and that 72% drive alone, 20% carpool, 4% use public transit, and the remaining 4% use some other method of transportation.

a. Describe the sample (*Be specific.*)
b. What would be the appropriate target population for this sample? (*Be specific.*)
c. Describe (in words) two variables discussed in this problem:
d. Is the average commute distance of 15 miles a parameter, a statistic, or the data?

2. Identify the type of data (qualitative, quantitative discrete, quantitative continuous)

a. The amount of time you wait in line at the bookstore to pay for your textbook purchase.
b. The title of the most expensive textbook you purchased this quarter.
c. The number of movie DVDs that a video store customer rented last month.

3. 80 customers at a video rental store were surveyed to determine the number of movie DVDs that each customer rented last month.

a. Fill in the underlined blank spaces in the table
   Show frequency and relative frequency to 3 decimal places (thousandths)

<table>
<thead>
<tr>
<th>Number of movie DVDs rented</th>
<th>Frequency</th>
<th>Relative Frequency</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>0.050</td>
<td>0.050</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>0.075</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>0.125</td>
<td>0.250</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>0.525</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td></td>
<td>0.750</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>0.150</td>
<td>0.900</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>0.100</td>
<td>1.000</td>
</tr>
</tbody>
</table>

b. What percent of customers in the sample rented 4 or fewer movie DVDs in the past month?
c. What percent of customers in the sample rented more than 3 movie DVDs in the past month?

4. State the type of sampling method used: (simple random, stratified, cluster, systematic, convenience)

a. A student writing an article about students’ educational goals for La Voz sits at a table in the lobby of the Student Services Building and interviews every sixth student who passes her.
b. A college administrator needs information about the students who use the tutorial center at a college. From a list of students who have registered to use the tutorial center, she randomly selects 100 students to complete a questionnaire.
c. A college bookstore manager conducts an online survey to find out how satisfied students are with the bookstore service and merchandise. Students who visit the bookstore are given flyers requesting that they visit a special website to answer questions for the survey.
A college cafeteria manager conducts a survey of 150 students to find out how satisfied students are with the service at the newly renovated cafeteria. In order to get students using the cafeteria throughout the day, he randomly selects 50 students in the morning, 50 in the afternoon, and 50 in the evening.

5. Using the data in problem number 3, calculate/determine the following.

   a. average = _________
   b. standard deviation = _______
   c. Q1 = ______
   d. Median = ______
   e. Mode = ______
   f. Q3 = ______
   g. IQR = ______
   h. The data value that is 2.5 standard deviations below the mean ______
   i. 10th percentile = ______
   j. 90th percentile = ______

6. Using the data in problem number 3, construct a histogram and boxplot. Label and scale both axes.

7. The following table identifies the number of hours that a certain group of De Anza students work per week

<table>
<thead>
<tr>
<th>Major is in the Division:</th>
<th>0-9</th>
<th>10-14</th>
<th>15-19</th>
<th>At least 20</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSME</td>
<td>20</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Language Arts</td>
<td>7</td>
<td>11</td>
<td>10</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>1</td>
<td>8</td>
<td>17</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   a. What is the probability that a randomly selected student of the group has a major in Business?
   b. What is the probability that a randomly selected student of the group either works from 0 to 9 hours a week or has a major in Language Arts?
   c. What is the probability that a randomly selected student of the group works from 10 – 14 hours a week and has a major in Business?
   d. What is the probability that a randomly selected student of the group has a major in Business given that the student works at least 20 hours a week?
   e. Are the events “has a major in PSME” and “Works 10-14 hours a week” independent? Justify your answer with numbers.

8. Let events E and F be such that P(E) = 0.5, P(F) = 0.6, and P(E|F) = 0.5

   a. Find P(F and E)
   b. Find P(F|E)
   c. Are F and E mutually exclusive? Why or why not?
   d. Are F and E independent? Why or why not?
9. Two marbles are chosen, one at a time without replacement, from an urn containing 7 blue and 5 red marbles.

   a. Draw a tree diagram.
   b. What is the probability that the first chosen marble is blue and the second is red?
   c. What is the probability that at most one marble is red in the two picks?
   d. What is the probability that the second marble is red given that the first marble is blue?

Then review anything I forgot to put in this review. I.E. make sure you have read all three chapters and prepared your study sheet.