3.2 Items are categorized according to an attribute with types X, Y, Z and according to state of origin.

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>NY</td>
<td>20</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>CA</td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

(a) Compare the number of items of each type made in each state with a side-by-side bar chart. Two ways to do this.

(b) Compare these numbers using a stacked bar chart which is also a bar chart for the state variable.

3.7. Given the quantitative bivariate data set for variables $x$ and $y$: (-2, 2), (-1, 2), (-1, 1), (1, -1), (1, -2), (2, -2).

(a) Make a scatterplot.

(b) Are $x$ and $y$ positively or negatively correlated or neither?

(c) Calculate the following:

$\bar{x} = \_\_\_\_\_\_\_\_\_$  \hspace{1cm}  $\bar{y} = \_\_\_\_\_\_\_\_$  \hspace{1cm}  $s_{xy} = \_\_\_\_\_\_$

$0, 0, 10$

$s_x = \_\_\_\_\_\_\_\_\_\_$  \hspace{1cm}  $s_y = \_\_\_\_\_\_\_\_\_\_$  \hspace{1cm}  $r = \_\_\_\_\_\_\_\_\_$

$11, 10, 14$

(d)(2) Find the equation $y = a + bx$ of the least-squares line.

(e) If $x=3$, estimate what $y$ is.

4.2. A sample space $S$ consists of five simple events with probabilities: $P(E_1) = P(E_2) = .15$, $P(E_3) = .4$, $P(E_4) = 2P(E_5)$.

(a) Find the probability of the simple event $E_5$.

$b) Find the probability of the event $A = \{E_1, E_3, E_4\}$.

(c) List the simple events in $A \cup B$ if $B = \{E_2, E_3\}$

(d) List the simple events in $A \cap B$.

4.4. A basketball player hits 70% of her free throws. The simple events are HH, HM, MH, MM where HM means a hit on the first throw and a miss on the second.

$P(HH) = .49$, $P(MH) = .21$, $P(MM) = .09$.

(a) Find the probability of a hit on the first throw and a miss on the second.

(b) Find the probability that the player will hit on at least one of the two throws.

4.6. Two dice are tossed.

(a)(2) Construct a tree diagram for this experiment.

(b) What is the probability that the sum of the numbers which come up is 7?