1. Ivy conducted a taste test for four different brands of chocolate chip cookies. Below is a two-way table that describes which cookie each subject preferred and their gender.

<table>
<thead>
<tr>
<th>Cookie Brand</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>4</td>
<td>6</td>
<td>13</td>
<td>13</td>
<td>36</td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>11</td>
<td>11</td>
<td>14</td>
<td>58</td>
</tr>
<tr>
<td>Totals</td>
<td>26</td>
<td>17</td>
<td>24</td>
<td>27</td>
<td>94</td>
</tr>
</tbody>
</table>

Suppose one subject from this experiment is selected at random.

(a) Find the probability that the selected subject preferred Brand C.

(b) Find the probability that the selected subject preferred Brand C, given that she is female.

(c) Are the events “preferred Brand C” and “female” independent? Explain.

(d) Are the events “preferred Brand C” and “female” mutually exclusive? Explain.

(e) If a random sample of two subjects is selected, what is the probability that neither preferred Brand A?
Quiz 5.3C   AP Statistics   Name:

1. Consider the following activity: The letters in the word AARDVARK are printed on identical plastic cards with one letter per card. The eight cards are then placed in a hat, and one card is randomly chosen (without looking) from the hat. The chance process we are interested in is what letter is on the selected card.

(a) List the sample space $S$ of all possible outcomes.

(b) Make a table that shows the set of outcomes and the probability of each outcome:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(c) Consider the following events:

$V$: the letter chosen is a vowel.
$F$: the letter chosen falls in the first half of the alphabet (that is, between A and M).

List the outcomes in each of the following events, and determine their probabilities:

$V = \{ \}$  $P(V) =$
$F = \{ \}$  $P(F) =$
$V \text{ or } F = \{ \}$  $P(V \text{ or } F) =$
$F^c = \{ \}$  $P(F^c) =$
$V \text{ and } F = \{ \}$  $P(V \text{ and } F) =$
$V \text{ given } F = \{ \}$  $P(V|F) =$

(d) Are the events $V$ and $F$ are independent? Explain.

(e) Are the events $V$ and $F$ mutually exclusive? Explain.