1. Section 4.2, Problem 19. The following are records on 1160 customers concerning the effectiveness of sales techniques.

<table>
<thead>
<tr>
<th></th>
<th>Sale</th>
<th>No Sale</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive</td>
<td>270</td>
<td>310</td>
<td>580</td>
</tr>
<tr>
<td>Passive</td>
<td>416</td>
<td>164</td>
<td>580</td>
</tr>
<tr>
<td>Column Total</td>
<td>686</td>
<td>474</td>
<td>1160</td>
</tr>
</tbody>
</table>

Suppose that a customer is selected at random from the 1160 customers. Denote the events as follows: \( A \) = aggressive approach, \( Pa \) = passive approach, \( S \) = sale, \( N \) = no sale.

(a) \( P(S) = \frac{686}{1160} = .59 \), \( P(S|A) = \frac{270}{580} = .47 \), \( P(S|Pa) = \frac{416}{580} = .72 \).

(b) The events \( S \) and \( Pa \) are not independent because the probability of \( S \) depends on whether an aggressive or passible sales approach was used, i.e. \( P(S|Pa) \neq P(S) \).

(c) \( P(A \text{ and } S) = \frac{270}{1160} = .23 \) and \( P(Pa \text{ and } S) = \frac{416}{1160} = .36 \).

(d) \( P(N) = \frac{474}{1160} = .41 \) and \( P(N|A) = \frac{310}{580} = .53 \).

(e) The events \( N \) and \( A \) are not independent because \( P(N) \neq P(N|A) \).

(f) \( P(A \text{ or } S) = P(A) + P(S) - P(A \text{ and } S) = .5 + .59 - .23 = .86 \); or from the table you can observe \( P(A \text{ or } S) = \frac{996}{1160} = .86 \).

2. Section 4.2, Problem 24. At Litchfield College of Nursing, 85% of incoming freshmen nursing students are female, and 15% are male. Recent records indicate that 70% of entering female students will graduate with a BSN degree while 90% of the male students will obtain a BSN degree. Let \( G \) be the event a student will graduate, let \( F \) be the event a student is female and let \( M \) be the event a student is male. If an incoming freshman nursing student is selected at random, find

(a) \( P(G|F) = .70 \).

(b) \( P(G \text{ and } F) = P(G|F)P(F) = (.70)(.85) = .595 \).

(c) \( P(G|M) = .90 \).

(d) \( P(G \text{ and } M) = P(G|M)P(M) = (.90)(.15) = .135 \).

(e) \( P(G) = .595 + .135 = .73 \) (a graduating student is either male or female).

(f) Explain the difference between \( P(G|F) \) and \( P(G \text{ and } F) \).

\( P(G|F) \) is the probability that a randomly chosen female student will graduate, while \( P(G \text{ and } F) \) is the probability that a randomly chosen student (including males) is female and will graduate.