4.3 Some Rules of Probability

Ex. As reported in *Employment and Earnings*, the age dist’n of employed persons 16 years old and over is

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency (000's)</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-19</td>
<td>6,500</td>
<td>A</td>
</tr>
<tr>
<td>20-24</td>
<td>12,138</td>
<td>B</td>
</tr>
<tr>
<td>25-34</td>
<td>32,077</td>
<td>C</td>
</tr>
<tr>
<td>35-44</td>
<td>35,051</td>
<td>D</td>
</tr>
<tr>
<td>45-54</td>
<td>25,514</td>
<td>E</td>
</tr>
<tr>
<td>55-64</td>
<td>11,739</td>
<td>F</td>
</tr>
<tr>
<td>65 &amp; over</td>
<td>3,690</td>
<td>G</td>
</tr>
<tr>
<td>Total</td>
<td>126,709</td>
<td></td>
</tr>
</tbody>
</table>

An employed person is selected at random. Let the following events be defined

- $W$ = the person is between 20 and 64
- $Y$ = the person is under 65
- $Z$ = the person is 55 or over.

Describe each of the following events in words and determine their probabilities.

a. (not $Y$)

Is the event that the person selected is

$$P(\text{not } Y) =$$

$$= $$

$$= $$

$$= $$
P (Y) = ?

Could use the

P (Y) = 

= 

= 

b. (not W)

Is the event that the person selected is

P(\overline{W}) = 

= 

Since A \cap G = 

= 

= 

= 

c. Y \cap Z (same as Y&Z)

Is the event that the person selected is

P (Y \cap Z) = 

= 

= 

= 

-2-