1. 1800 people were surveyed. The following table contains data about their favorite colors.

<table>
<thead>
<tr>
<th></th>
<th>B BLUE</th>
<th>R RED</th>
<th>G GREEN</th>
<th>Y YELLOW</th>
<th>Pu PURPLE</th>
<th>Pi PINK</th>
<th>O ORANGE</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOMEN (M')</td>
<td>80</td>
<td>170</td>
<td>80</td>
<td>20</td>
<td>250</td>
<td>350</td>
<td>30</td>
<td>980</td>
</tr>
<tr>
<td>MEN (M)</td>
<td>450</td>
<td>100</td>
<td>120</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>130</td>
<td>820</td>
</tr>
<tr>
<td>TOTALS</td>
<td>530</td>
<td>270</td>
<td>200</td>
<td>30</td>
<td>255</td>
<td>355</td>
<td>160</td>
<td>1800</td>
</tr>
</tbody>
</table>

Use the table to calculate the following probabilities.

A. The probability that a person selected at random from this group is a man and their favorite color is green. $P(M \cap G)$

$$\frac{120}{1800} = \frac{1}{15} \sim 0.067 \text{ or } 6.7\% \text{ (any answer is fine – the first is the preferred)}$$

B. The probability that a person selected is a woman or favorite color is red. $P(M' \cup R)$

$$\frac{980 + 100}{1800} = \frac{1080}{1800} = \frac{3}{5} \sim 0.6 \text{ or } 60\%$$

C. The probability that a person selected at random is a woman given that favorite color is purple. $P(M' | Pu)$

$$\frac{250}{255} = \frac{50}{51} \sim 0.98 \text{ or } 98\%$$

D. The probability that person selected at random has favorite color of red, given that the person is a man. $P(R | M)$

$$\frac{100}{820} = \frac{5}{41} \sim 0.12 \text{ or } 12\%$$

E. The probability that a person selected at random from this group is a man and their favorite color is not purple. $P(M \cap Pu')$

$$\frac{450 + 100 + 120 + 10 + 5 + 130}{1800} = \frac{815}{1800} = \frac{163}{360} \sim 0.45 = 45\%$$
### Blood Type Distribution

<table>
<thead>
<tr>
<th>Blood Type</th>
<th>Male</th>
<th>Female</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>80</td>
<td>370</td>
<td>450</td>
</tr>
<tr>
<td>A</td>
<td>150</td>
<td>250</td>
<td>400</td>
</tr>
<tr>
<td>B</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>AB</td>
<td>20</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>TOTAL</td>
<td>300</td>
<td>700</td>
<td>1,000</td>
</tr>
</tbody>
</table>

2. Use the table to find the probability that a person is selected at random from the group
   
   **Note:** Key words have bold type!!

   A. has blood type B?
   
   \[
   \frac{100}{1,000} = 0.1
   \]

   B. is female and has blood type B?
   
   \[
   \frac{50}{1,000} = 0.05
   \]

   C. has blood type B given that the person is female?
   
   \[
   \frac{50}{700} = \frac{5}{70}
   \]

   D. is female given that the person has blood type B?
   
   \[
   \frac{50}{100} = 0.5
   \]

   E. the person is female or has blood type B?
   
   \[
   \frac{(700 + 50)}{1,000} = \frac{750}{1,000} = 0.75
   \]