2.

#17.

<table>
<thead>
<tr>
<th></th>
<th>Tall</th>
<th>Short</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>900</td>
<td>300</td>
<td>1200</td>
</tr>
<tr>
<td>Yellow</td>
<td>300</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1200</strong></td>
<td><strong>400</strong></td>
<td><strong>1600</strong></td>
</tr>
</tbody>
</table>

(a) No.

# of "Tall" and "green pods" = 900

Thus, they are not mutually exclusive.

(b) Yes.

P(Tall) = 1200/1600 = 3/4,  P(green pods) = 1200/1600 = 3/4

P(Tall and Green pods) = 900/1600 = 9/16

= P(Tall)P(green pods)

By the definition of independence, they are independent.

#21.

(a)

<table>
<thead>
<tr>
<th>1st</th>
<th>2nd</th>
<th>answer</th>
<th>prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td></td>
<td>&quot;Yes&quot;</td>
<td>0.25 (=0.5*0.5)</td>
</tr>
<tr>
<td>head</td>
<td></td>
<td>&quot;No&quot;</td>
<td>0.25 (=0.5*0.5)</td>
</tr>
<tr>
<td>tail</td>
<td></td>
<td>&quot;Yes&quot;</td>
<td>0.1 (=0.5*0.2)</td>
</tr>
<tr>
<td>tail</td>
<td></td>
<td>&quot;No&quot;</td>
<td>0.4 (=0.5*0.8)</td>
</tr>
</tbody>
</table>

(b)

P(Yes) = 0.25 + 0.1 = 0.35
#29.
P(1^{st} = \text{Win} \text{ and } 2^{nd} = \text{Win} \text{ and } 3^{rd} = \text{Win} \text{ and } 4^{th} = \text{Win} \text{ and } 5^{th} = \text{Win})
= 0.5^5 = 0.03125

The result is very close to 3%. It means that we expect about 3% generals to become famous just by chance, even if you don't have particularly better skills than others.

3.
(a)
\[ E(Y) = 0 \times 0.2 + 1 \times 0.55 + 2 \times 0.25 = 1.05 \]

(b)
\[ \text{Var}(Y) = 0.2 \times (0 - 1.05)^2 + 0.55 \times (1 - 1.05)^2 + 0.25 \times (2 - 1.05)^2 
= 0.4475 
\]
\[ \text{SD}(Y) = \sqrt{0.4475} = 0.6689544 \]