IV. A bank found that the average number of cars waiting during the noon hour at a drive-up window follows a Poisson distribution with a mean of 2 cars. Make a chart of this distribution using a Poisson distribution table. Graph the distribution and answer these questions concerning the probability of cars waiting at the drive-up window.

A.

<table>
<thead>
<tr>
<th>x</th>
<th>P(x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.3</td>
</tr>
<tr>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td>2</td>
<td>.1</td>
</tr>
<tr>
<td>3</td>
<td>.09</td>
</tr>
<tr>
<td>4</td>
<td>.03</td>
</tr>
<tr>
<td>5</td>
<td>.01</td>
</tr>
<tr>
<td>6</td>
<td>.00</td>
</tr>
<tr>
<td>7</td>
<td>.00</td>
</tr>
<tr>
<td>8</td>
<td>.00</td>
</tr>
<tr>
<td>9</td>
<td>.00</td>
</tr>
</tbody>
</table>

Number of Cars Waiting

<table>
<thead>
<tr>
<th>x</th>
<th>( \mu = 2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.1353</td>
</tr>
<tr>
<td>1</td>
<td>.2707</td>
</tr>
<tr>
<td>2</td>
<td>.2707</td>
</tr>
<tr>
<td>3</td>
<td>.1804</td>
</tr>
<tr>
<td>4</td>
<td>.0902</td>
</tr>
<tr>
<td>5</td>
<td>.0361</td>
</tr>
<tr>
<td>6</td>
<td>.0120</td>
</tr>
<tr>
<td>7</td>
<td>.0034</td>
</tr>
<tr>
<td>8</td>
<td>.0009</td>
</tr>
<tr>
<td>9</td>
<td>.0002</td>
</tr>
</tbody>
</table>

B. No cars waiting

\[ P(x = 0) = .1353 \rightarrow 13.53\% \]

C. Two cars waiting

\[ P(x = 2) = .2707 \rightarrow 27.07\% \]

D. At least three cars waiting

\[ P(x \geq 3) = [1 - (.1353 + .2707 + .2707)] = [1 - .6767] = .3233 \rightarrow 32.33\% \]

E. Not as many as 3 cars waiting

\[ P(x \leq 2) = .1353 + .2707 + .2707 = .6767 = 67.67\% \]

Note: The events described by questions C and D are complements and their answers total to one.