1. (6 points) Complete the following table:

<table>
<thead>
<tr>
<th>x</th>
<th>$q_x$</th>
<th>$l_x$</th>
<th>$d_x$</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>0.04</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>51</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td></td>
<td></td>
<td>750</td>
</tr>
<tr>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calculate each $l_x$ for the table.
2. (6 points) You are given that the mortality for all students of Purdue University follows the Illustrative Life Table. There are 10,000 students who are age 20 at Purdue University.

Let \( L_{45} \) be the random variable representing the number who will still be alive at age 65.

Calculate the expected value of \( L_{45} \) plus one standard deviation of \( L_{45} \).
3. (8 points) You are given:

   a. \( q_{80} = 0.08 \)
   
   b. \( q_{81} = 0.10 \)
   
   c. Deaths between age 80 and 81 are uniformly distributed.
   
   d. Deaths between 81 and 82 are subject to a constant force of mortality.

Calculate \( p_{1.2}^{80.4} \).