1. Base 3 and Beyond

Create a spreadsheet that calculates the base-3 representation of an integer using the following set-up. Enter values in the input cell (C9) to test.

<table>
<thead>
<tr>
<th>&lt;Input #&gt;</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3^D7</td>
<td>3^E7</td>
<td>3^F7</td>
<td>3^G7</td>
<td>3^H7</td>
</tr>
<tr>
<td>=C9</td>
<td>=INT(C10/D8)</td>
<td>=INT(D10/E8)</td>
<td>=INT(E10/F8)</td>
<td>=INT(F10/G8)</td>
<td>=INT(G10/H8)</td>
</tr>
<tr>
<td></td>
<td>=C9-D9*D8</td>
<td>=D10-E9*E8</td>
<td>=E10-F9*F8</td>
<td>=F10-G9*G8</td>
<td>=G10-H9*H8</td>
</tr>
</tbody>
</table>

Using the above as a model, add a section to your spreadsheet that calculates the base-3 representation of a positive decimal number in [0,1). Enter values in the input cell (C9) to test.

2. The Middle-Thirds Cantor Set

For the following first few sets used in the construction of the Middle-Thirds Cantor Set, describe the base three decimal representation of those points in [0,1] not in that particular set.

\[ C_0 = [0,1] \]

\[ C_1 = [0,1/3] \cup [2/3,1] \]
\[ C_2 = [0, 1/9] \cup [2/9, 3/9] \cup [6/9, 7/9] \cup [8/9, 1] \]

\[ C_3 = \]

\[ C_4 = \]

3. **In Your Own Words**

Describe the Middle Thirds Cantor Set in terms of base-three decimals.

4. **Is \(1/4\) in the Middle-Thirds Cantor Set?**