Cell phones must be turned off entirely - no ringers, no vibrating (even that is noticeable) - to provide a nondistracting environment for all.

1. [8 pts - 4 each] Name a different strategy that could be reasonably attempted for each problem below. Justify **WHY** that strategy applies, but do not solve nor describe how to solve.

(a) When you drop a SuperBall ball, it always rebounds to half its previous height. If you drop it from the top of a 768-foot building, how high off the ground is it when it's bounced for a total of 2,240 feet? Draw a picture - you need to visualize. Look for a pattern - the factor of \( \frac{1}{2} \) will be used repeatedly.

(b) If you expanded the number \((33333333333334)^2\), how many 5’s would there be in the result? Solve a simpler problem - this number is too large. Look for a pattern - there is already repetition of the 3’s.

2. [8 pts - 4 each] Find a formula for the \( n \)th term of each sequence below. Show sufficient clear work; if showing ample work is not possible, describe your reasoning verbally.

(a) \( 95, 92, 89, 86, \ldots \)

<table>
<thead>
<tr>
<th>Pos.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term</td>
<td>95</td>
<td>92</td>
<td>89</td>
<td>86</td>
<td></td>
</tr>
</tbody>
</table>

\[-3n = -3\cdot 95 = -285 \]

\[-3(n-1) = 92 \]

\[-3n = -285 \text{ mod } 98 \] here

\[n^\text{th} \text{ term} = 98 - 3n\]

(b) \( 2, 8, 18, 32, \ldots \)

<table>
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</table>

\[n^{th} \text{ term} = n \cdot 2^n\]

3. [5 pts] Bob gave \( \frac{3}{8} \) of his candy canes to Rachel, 12 to Jessica, and half of what was left to Micah, leaving him with 24. How many did he start with? Show clear work, but you need not explain.

\[
\begin{align*}
96 & \quad \text{gave } \frac{3}{8} \quad \text{kept } \frac{5}{8} \\
60 & \quad \text{gave } 12 \\
48 & \quad \text{gave } \frac{1}{2} \\
24 & \quad \text{left} \\
\end{align*}
\]

\[60 = 5 \cdot \frac{3}{8}, \quad \frac{5}{8} \cdot x = 96\]

\[x = 96 \cdot \frac{8}{5} = 96\]

He had 96.