S.ID.B.6: Regression 3

1. The population of a small town over four years is recorded in the chart below, where 2013 is represented by $x = 0$. [Population is rounded to the nearest person]

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>3810</td>
<td>3943</td>
<td>4081</td>
<td>4224</td>
</tr>
</tbody>
</table>

The population, $P(x)$, for these years can be modeled by the function $P(x) = ab^x$, where $b$ is rounded to the nearest thousandth. Which statements about this function are true?

I. $a = 3810$
II. $a = 4224$
III. $b = 0.035$
IV. $b = 1.035$

1) I and III 3) II and III
2) I and IV 4) II and IV

2. An application developer released a new app to be downloaded. The table below gives the number of downloads for the first four weeks after the launch of the app.

<table>
<thead>
<tr>
<th>Number of Weeks</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Downloads</td>
<td>120</td>
<td>180</td>
<td>270</td>
<td>405</td>
</tr>
</tbody>
</table>

Write an exponential equation that models these data. Use this model to predict how many downloads the developer would expect in the 26th week if this trend continues. Round your answer to the nearest download. Would it be reasonable to use this model to predict the number of downloads past one year? Explain your reasoning.
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Answer Section

1 ANS: 2 REF: 061916ai

2 ANS:
\[ y = 80(1.5)^x \quad 80(1.5)^{52} \approx 3,030,140. \] No, because the prediction at \( x = 52 \) is already too large.

REF: 061536ai