Data Linearization
The table below gives the number of computers connected to the internet for selected years.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers (in millions)</td>
<td>.08</td>
<td>.2</td>
<td>.4</td>
<td>.8</td>
<td>6.9</td>
<td>30</td>
</tr>
</tbody>
</table>

1. Based on the data, find the best fitting exponential model. Let \( x = 0 \) correspond to 1989. (General form: \( y = C \cdot 10^{ax} \))

2. Use the model to predict the number of computers connected to the internet in the year 2005.

### Scatterplot for dataset (x, y)

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>.08</td>
<td>.2</td>
<td>.4</td>
<td>.8</td>
<td>6.9</td>
<td>30</td>
</tr>
</tbody>
</table>

![Scatterplot](image-url)
Scatterplot for dataset \((x, \log_{10} y)\)

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>0.08</td>
<td>0.2</td>
<td>0.4</td>
<td>0.8</td>
<td>6.9</td>
<td>30</td>
</tr>
<tr>
<td>y</td>
<td>-1.0969</td>
<td>-0.6990</td>
<td>-0.3979</td>
<td>-0.0969</td>
<td>0.8388</td>
<td>1.4771</td>
</tr>
</tbody>
</table>

\[
y = C \cdot 10^{bx}
\]

\[
\log_{10} y = \log_{10} (C \cdot 10^{bx})
\]

\[
\log_{10} y = \log_{10} C + \log_{10} 10^{bx}
\]

\[
\log_{10} y = \log_{10} C + bx
\]

Start with the exponential model

take the log of both sides

use the log properties to simplify

use the log inverse property

Notice that the last line is a linear equation in the variables \((x, \log_{10} y)\).
The slope is \(b\) and the \(y\)-intercept is the constant, \(\log_{10} C\).
We will use the Least Squares Method to find the coefficients \(\log_{10} C\) and \(b\). From these we can find \(C\) and \(b\) for the exponential model.