Notes 4.1 Exponential Functions

For the following exercises, determine whether the table could represent a function that is linear, exponential or neither.

1.

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>f(x)</td>
<td>60</td>
<td>20</td>
<td>20</td>
<td>-80</td>
</tr>
</tbody>
</table>

Linear

Constant Rate of Change

2.

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>f(x)</td>
<td>2.3</td>
<td>5.29</td>
<td>12.167</td>
<td>27.967</td>
</tr>
</tbody>
</table>

Exponential

3.

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>f(x)</td>
<td>0</td>
<td>5</td>
<td>20</td>
<td>45</td>
</tr>
</tbody>
</table>

Neither

For the following exercises use the compound interest formula \( A(t) = P \left(1 + \frac{r}{n}\right)^{nt} \)

1. After a certain number of years, the value of an investment account is represented by the equation \( A(t) = 5000 \left(1 + \frac{0.05}{365}\right)^{365t} \). What is the value of the account?
   \[ \$6,106.9 \]

2. What was the initial deposit made to the account in the previous exercise?
   \[ n = 365 \]
   \[ \frac{1460}{365} = 4 \]

3. How many years had the account from the previous exercise been accumulating interest?
4. An account is opened with an initial deposit of $4000 and earns 2.7% interest compounded quarterly. What will the account be worth in 10 years?

\[ 4000 \left(1 + \frac{.027}{4}\right)^{40} \]

5. How much more would the account in problem 4 been worth if the interest was compounded monthly?

6. Find the initial deposit of an account that is worth $20000 after earning 4.5% interest compounded weekly for 6 years?

\[ 20,000 = P \left(1 + \frac{.045}{52}\right)^{312} \]

7. Suppose an investment account is opened with an initial deposit of $10000 earning 8.4% interest compounded continuously. How much will the account be worth in 20 years?

\[ 53,655.55 \]

8. How much would the account in #7 be worth after 20 years if it were compounded monthly instead?

\[ 10,000 \left(1 + \frac{.084}{12}\right)^{240} \]

\[ 53,342.44 \]