Using function notation.

Given \( f(x) = -2x + 3 \) and \( g(x) = 8x - 7 \), evaluate the following functions.

1. \( f(-5) = \)  
2. \( g(-5) = \)  
3. \( f(6) = \)  
4. \( g(6) = \)  

Using \( f(x) \) and \( g(x) \) above, solve for \( x \) given the following output values.

5. \( f(x) = 11 \)  
6. \( g(x) = 25 \)  
7. \( f(x) = 7 \)  
8. \( g(x) = -31 \)  

Determine whether the given information represents an arithmetic or geometric sequence. Then write the recursive and the explicit formula for each.

9. 11, 17, 23, 29, ...  
   Arithmetic or Geometric?  
   Recursive: __________  
   Explicit: __________  

10. 4, 12, 36, 108, ...  
    Arithmetic or Geometric?  
    Recursive: __________  
    Explicit: __________  

11. Write the first five terms in the sequence given the following recursive formula:

\[
\begin{align*}
a_0 & = 22 \\
a_n & = a_{n-1} - 8
\end{align*}
\]

\( a_1 = \) ________  
\( a_2 = \) ________  
\( a_3 = \) ________  
\( a_4 = \) ________  
\( a_5 = \) ________  

12. What are the first five terms in the sequence given the explicit formula:

\[
f(x) = 5(3)^x
\]

\( f(1) = \) ________  
\( f(2) = \) ________  
\( f(3) = \) ________  
\( f(4) = \) ________  
\( f(5) = \) ________
13. Given the recursive formula, write the explicit formula.

\[ a_0 = 22 \]
\[ a_n = a_{n-1} \times 6 \]
\[ f(x) = \text{___________________} \]

14. Given the explicit formula, write the recursive formula.

\[ f(x) = 12x + 13 \]
\[ a_0 = \text{_______} \]
\[ a_n = \text{___________________} \]

Below you are given various pieces of information. Graph each function and write the recursive and explicit functions for each sequence.

15. 16, 8, 4, 2, 1 ...

Recursive: \text{___________________} \text{___________________} \text{___________________}

Explicit: \text{___________________}

16.

<table>
<thead>
<tr>
<th>Time (days)</th>
<th>Number of Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
</tr>
</tbody>
</table>

Recursive: \text{___________________} \text{___________________} \text{___________________}

Explicit: \text{___________________}
17. Mr. Honell has decided to put money into a savings account that earns 4% interest each year. Mr. Honell starts by initially putting $2000 into his account.

a) Complete the table for the given scenario.

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount in savings account</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

b) Recursive Formula: ______________

c) Explicit Formula: ______________

d) How much money will Mr. Honell have in his account after 25 years (granted he is able to keep his grubby little hands off the money prior to that)? Which of the above formulas did you use to calculate this value?

18. Molly has a $25 iTunes gift card. Each time she downloads a song it costs her $2.

Arithmetic or Geometric? Recursive: ______________

Explicit: ______________

How many songs can Molly download? Set up an equation and solve it to explain.

Use the given table to answer the following questions.

<table>
<thead>
<tr>
<th>n</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>f(n)</td>
<td>12</td>
<td>21</td>
<td>30</td>
<td>39</td>
<td>48</td>
<td>57</td>
</tr>
</tbody>
</table>

19. a) When \( f(n) = 39 \), what is the value of \( n \)? ______________

b) What is the value of \( f(n - 3) \)? ______________

20. a) When \( f(n) = 30 \), what is the value of \( n \)? ______________

b) What is the value of \( f(n + 1) \)? ______________
Find the ARITHMETIC means of the following sequences and identify the constant difference.

21. 

\[
\begin{array}{ccccccc}
  x & 1 & 2 & 3 & 4 & 5 & d = \\
  y & 7 & & & & 43 & \\
\end{array}
\]

22. 

\[
\begin{array}{ccccccccc}
  x & 1 & 2 & 3 & 4 & 5 & 6 & d = \\
  y & 2 & & & & & 1 & \\
\end{array}
\]

23. 

\[
\begin{array}{cccccccc}
  x & 1 & 2 & 3 & 4 & 5 & 6 & 7 & d = \\
  y & 14 & & & & & 35 & \\
\end{array}
\]

24. Find the 4 arithmetic means between 16 and 101.

Find the GEOMETRIC means of the following sequences and identify the constant ratio.

25. 

\[
\begin{array}{ccccccc}
  x & 1 & 2 & 3 & 4 & 5 & r = \\
  y & 3 & & & & 768 & \\
\end{array}
\]

26. 

\[
\begin{array}{cccccccc}
  x & 1 & 2 & 3 & 4 & 5 & 6 & r = \\
  y & -7 & & & & 1701 & \\
\end{array}
\]

27. 

\[
\begin{array}{cccccccc}
  x & 1 & 2 & 3 & 4 & 5 & 6 & r = \\
  y & 1824 & & & & 57 & \\
\end{array}
\]

28. Find the 3 geometric means between 4 and 5184.