LT: I can write an arithmetic or a geometric sequences given a word problem.

1. What is the next number in this sequence?
   \[0.03, 0.12, 0.48, 1.92, ____\]
   (A) 1.95
   (B) 3.36
   (C) 5.08
   (D) 7.68

2. Which of the following is an arithmetic sequence?
   Sequence R: 1, 4, 7, 10, 13
   Sequence S: 1, 5, 25, 125, 625
   (A) R
   (B) S
   (C) R and S
   (D) None of the above

3. What is the next number in this sequence?
   \[2, 16, 128, 1024, ____\]
   (A) 1,920
   (B) 8,192
   (C) 11,256
   (D) 16,384

4. Which of these is the equation that generalizes the pattern of the data in the table?
   \[
   \begin{array}{c|c}
   x & f(x) \\
   \hline
   -3 & -5 \\
   -1 & 1 \\
   2 & 10 \\
   5 & 19 \\
   \end{array}
   \]
   (A) \(f(x) = 3x\)
   (B) \(f(x) = x + 3\)
   (C) \(f(x) = 2x + 6\)
   (D) \(f(x) = 3x + 4\)

5. As shown in the table, the monthly rent of an apartment depends on the number of bedrooms. If the pattern is extended, which of these is the likely cost of a 4-bedroom apartment?
   \[
   \begin{array}{c|c}
   \text{Bedrooms} & \text{Rent} \\
   \hline
   1 & $550 \\
   2 & $625 \\
   3 & $700 \\
   \end{array}
   \]
   (A) $715
   (B) $725
   (C) $750
   (D) $775

6. During a science experiment, Kyle counted the number of bacteria present in a petri dish after every minute. Assuming the pattern continues, how many bacteria will there be after 20 minutes?
   \[
   \begin{array}{c|c}
   \text{Number of Bacteria} & \text{Minute} \\
   \hline
   2 & 1 \\
   4 & 2 \\
   8 & 4 \\
   16 & 8 \\
   \end{array}
   \]
   (A) 1048576
   (B) 2097152
   (C) 320
   (D) 380

7. What is the missing term in the sequence below?
   \[-110, ____ , -146\]
   (A) -120
   (B) -130
   (C) -128
   (D) -140
8. Which sequence is arithmetic?
   a) 1, 1, 2, 3, 5, 8, ...
   b) 12, 7, 2, -3, -8, ...
   c) -2, 4, -6, 8, -10, ...
   d) -27, -9, -3, -1, $\frac{1}{3}$, ...

9. What sequence is generated by the equation $f(x) = -2x + 7$ for $x = 0, 1, 2, 3, \ldots$?
   A. 0, 7, 14, 21, 28, ...
   B. -2, 5, 12, 19, 26, ...
   C. 7, 5, 3, 1, -1, -3, ...
   D. 7, 9, 11, 13, 15, ...

10. What sequence is generated by the equation $f(x) = 9x - 5$ for $x = 0, 1, 2, 3, \ldots$?
    A. 0, 9, 18, 27, 36, ...
    B. -5, 4, 13, 22, 31, ...
    C. 9, 4, -1, -6, -11, ...
    D. -5, -14, -23, -32, -41, ...

11. What sequence is generated by the equation $f(x) = 4x + 1$ for $x = 0, 1, 2, 3, \ldots$?
    (A) 5, 6, 7, 8
    (B) -1, 0, 1, 2
    (C) 1, 5, 9, 13
    (D) 4, 5, 6, 7

12. The equation $f(x) = 5x - 3$ generates the arithmetic sequence -3, 2, 7, 12, 17, \ldots for $x = 0, 1, 2, 3, \ldots$ What is the 31st term in the sequence?
    A. 30
    B. 147
    C. 150
    D. 152

13. The equation $f(x) = -10x + 27$ generates the arithmetic sequence 27, 17, 7, -3, -13, \ldots for $x = 0, 1, 2, 3, \ldots$ What is the 26th term in the sequence?
    A. -287
    B. -277
    C. -233
    D. -223

14. Which equation can be used to generate the arithmetic sequence -7, -4, -1, 2, 5, 8, \ldots for $x = 0, 1, 2, 3, \ldots$?
    A. $f(x) = -3x - 7$
    B. $f(x) = 3x - 7$
    C. $f(x) = -7x + 3$
    D. $f(x) = 7x + 3$

15. Which equation can be used to generate the arithmetic sequence 54, 48, 42, 36, 30, \ldots for $x = 0, 1, 2, 3, \ldots$?
    A. $f(x) = 54x - 6$
    B. $f(x) = 6x - 54$
    C. $f(x) = -6x + 54$
    D. $f(x) = -6x - 6$

16. The equation $f(x) = 4.2x - 3$ represents an arithmetic sequence. What is the common difference between consecutive terms?
    A. -1
    B. 1
    C. 3
    D. 4.2

17. Which of the following best describes the arithmetic sequence 2, 5, 8, 11, 14, \ldots ?
    A. Not a function
    B. A linear function
    C. A function, but not linear
    D. $f(x) = 2x + 3$
18. Which sequence is geometric?
   a) 1, 1, 2, 3, 5, 8, ...
   b) 12, 7, 2, -3, -8, ...
   c) -2, 4, -6, 8, -10, ...
   d) -27, -9, -3, -1, -\frac{1}{3}, ...

19. What sequence is generated by the equation \( f(x) = -2(5)^x \) for \( x = 0, 1, 2, 3, \ldots \)?
   A. 5, 10, 20, 40, 80, ...
   B. -2, -10, -50, -250, -1,250, ...
   C. -2, 10, -50, 250, -1,250, ...
   D. -5, 10, -20, 40, -80, ...

20. What sequence is generated by the equation \( f(x) = 81(-\frac{1}{3})^x \) for \( x = 0, 1, 2, 3, \ldots \)?
   A. 81, 78, 75, 72, 69, ...
   B. -81, -27, -9, -3, -1, ...
   C. 81, 27, 9, 3, 1, ...
   D. 81, -27, 9, -3, 1, ...

21. Which equation can be used to generate the geometric sequence 3, 6, 12, 24, 48, 96, \ldots for \( x = 0, 1, 2, 3, \ldots \)?
   A. \( f(x) = 2(3)^x \)
   B. \( f(x) = 3(2)^x \)
   C. \( f(x) = 3(3)^x \)
   D. \( f(x) = 96(\frac{1}{2})^x \)

22. The equation \( f(x) = 128(\frac{1}{2})^x \) generates the arithmetic sequence 128, 64, 32, 16, 8, \ldots for \( x = 0, 1, 2, 3, \ldots \).What is the 10th term in the sequence?
   A. 1
   B. \frac{1}{2}
   C. \frac{1}{4}
   D. \frac{1}{8}

23. Which sequence is geometric?
   (A) 9, 7, 5, 3, 1, ...
   (B) 0.5, 1, 2, 4, ....
   (C) -9, -7, -5, -3, -1, ....
   (D) -4, -2, 0, 2, 4, ....

24. In the function \( f(x) = 3^x \), if a positive value of \( x \) is increased by 2, what is the effect on the value of the function?
   A. It is \( \frac{1}{3} \) the original amount.
   B. It is 6 times the original amount.
   C. It is 9 times the original amount.
   D. It is equal to the original amount.

25. Which of the following best describes the geometric sequence 2, 4, 8, 16, 32, 64, \ldots ?
   A. Not a function
   B. A linear function
   C. A function, but not linear
   D. \( f(x) = 2(\frac{1}{2})^x \)

26. Certain bacteria can double in number over 1 hour. Suppose a collection of 60 bacterium cells is placed in a petri dish. Which equation can be used to find how many cells, \( c \), there would be after \( x \) hours?
   A. \( c = 60(x)^2 \)
   B. \( c = 60(2)^x \)
   C. \( c = 2(60)^x \)
   D. \( c = 2(x)^{60} \)

27. Which equation can be used to generate the arithmetic sequence 54, 18, 6, 2, \frac{2}{3}, \ldots for \( x = 0, 1, 2, 3, \ldots \)?
   A. \( f(x) = 54(\frac{1}{3})^x \)
   B. \( f(x) = -54(\frac{1}{3})^x \)
   C. \( f(x) = 54(-\frac{1}{3})^x \)
   D. \( f(x) = 54(3)^\frac{1}{x} \)
<table>
<thead>
<tr>
<th>IF</th>
<th>Checking: p. 6-8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Box 4</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Is this sequence below arithmetic or geometric?</strong> How do you know?</td>
<td><strong>Write an equation for the sequence. What is the 51st term?</strong></td>
</tr>
<tr>
<td>1, 4, 16, 64, ...</td>
<td>( f(x) = 1(4)^x )</td>
</tr>
<tr>
<td>Geometric sequence</td>
<td></td>
</tr>
</tbody>
</table>
Geometric Sequence

\[ f(x) = a(b)^x \]

1) \[4, 12, 36, 108, \ldots \]
   Rule for Sequence (b): \( \frac{3}{1} \)
   Starting Amount (a): \( 4 \)
   Equation: \( f(x) = 4 \left( \frac{3}{1} \right)^x \)
   7th term: \( 2916 \) (so \( x = 6 \) for the 7th term)

2) \[0.25, 0.5, 1, 2, \ldots \]
   Rule for Sequence (b): \( \frac{2}{1} \)
   Starting Amount (a): \( 0.25 \)
   Equation: \( f(x) = 0.25 \left( \frac{2}{1} \right)^x \)
   7th term: \( 10 \) (so \( x = 6 \) for the 7th term)

3) \[0.1, 0.2, 0.4, 0.8, \ldots \]
   Rule for Sequence (b): \( \frac{2}{1} \)
   Starting Amount (a): \( 0.1 \)
   Equation: \( f(x) = 0.1 \left( \frac{2}{1} \right)^x \)
   7th term: \( 0.0625 \) (so \( x = 6 \) for the 7th term)

4) \[8, 0.5, 0.125, \ldots \]
   Rule for Sequence (b): \( \frac{1}{2} \)
   Starting Amount (a): \( 8 \)
   Equation: \( f(x) = 8 \left( \frac{1}{2} \right)^x \)
   7th term: \( \frac{1}{512} \) or 0.00195 (so \( x = 6 \) for the 7th term)

5) \[4, 16x, 64x^2, 256x^3, \ldots \]
   Rule for Sequence (b): \( 4x \)
   Starting Amount (a): \( 4 \)
   Equation: \( f(x) = 4 \left( \frac{4x}{1} \right)^x \)
   7th term: \( 16,384x^6 \) (so \( x = 6 \) for the 7th term)

6) \[2, 2, 2, 2, \ldots \]
   Rule for Sequence (b): \( \frac{1}{1} \)
   Starting Amount (a): \( 2 \)
   Equation: \( f(x) = 2 \left( \frac{1}{1} \right)^x \)
   7th term: \( 2 \) (so \( x = 6 \) for the 7th term)
Geometric Sequences

\[ f(x) = a \cdot b^x \]

7) \[ 1, \frac{1}{2}, \frac{1}{4}, \ldots \]
Rule for Sequence (b): \( \cdot \frac{1}{2} \)
Starting Amount (a): \( \frac{1}{2} \)
Equation: \( f(x) = \frac{1}{2} \cdot \left( \frac{1}{2} \right)^x \)

7th term: \( \frac{1}{2^{18}} = 0.00045 \)

(\( so \ X = \frac{1}{2} \) for the 7th term)

8) \[ 1, 2, 4, 8, \ldots \]
Rule for Sequence (b): \( \cdot 2 \)
Starting Amount (a): \( 1 \)
Equation: \( f(x) = 1 \cdot (2)^x \)

7th term: \( (2)^6 \)

(\( so \ X = 2 \) for the 7th term)

9) \[ 5, 5x^2, 5x^4, 5x^6, \ldots \]
Rule for Sequence (b): \( \cdot x^2 \)
Starting Amount (a): \( 5 \)
Equation: \( f(x) = 5 \cdot (x^2)^x \)

7th term: \( 5 \cdot (x^2)^6 \)

(\( so \ X = x^2 \) for the 7th term)

10) \[ 7, 35, 175, 875, \ldots \]
Rule for Sequence (b): \( \cdot 5 \)
Starting Amount (a): \( 7 \)
Equation: \( f(x) = 7 \cdot (5)^x \)

7th term: \( 109375 \)

(\( so \ X = 5 \) for the 7th term)

11) \[ a^2, 2a^2, 4a^2, 8a^2, \ldots \]
Rule for Sequence (b): \( \cdot 2 \)
Starting Amount (a): \( a^2 \)
Equation: \( f(x) = a^2 \cdot (2)^x \)

7th term: \( a^2 \cdot 64 \)

(\( so \ X = 2 \) for the 7th term)

12) \[ 320, 80, 20, 5, \ldots \]
Rule for Sequence (b): \( \cdot \frac{1}{4} \)
Starting Amount (a): \( 320 \)
Equation: \( f(x) = 320 \cdot \left( \frac{1}{4} \right)^x \)

7th term: \( 320 \left( \frac{1}{4} \right)^6 \)

(\( so \ X = \frac{1}{4} \) for the 7th term)
13. Find the base of the right triangle below.

\[ \frac{12}{15} \frac{7.5}{150} \frac{22.5}{8 \text{ cm}} \]

The triangle is not drawn to scale.

\[ 8^2 + x^2 = 17^2 \]
\[ 64 + x^2 = 289 \]
\[ x^2 = 225 \]
\[ x = 15 \]

14. The base of a ladder is placed 6 feet from a wall. The top of the ladder rests 8 feet up on the wall. How long is the ladder?

\[ 6^2 + 8^2 = x^2 \]
\[ 36 + 64 = x^2 \]
\[ 100 = x^2 \]
\[ x = 10 \text{ feet} \]

15. Find the point of intersection by equation.

\[ \begin{cases} y = 6 - 2x \\ y = 6 + 1.5(2x + 4) \end{cases} \]

\[ 6 - 2x = 3(2x + 4) \]
\[ 6 - 2x = 6x + 12 \]
\[ 6 + 2x = 6x + 12 \]
\[ 6 + 2(3) = 6x + 12 \]
\[ 6 + 6 = 6x + 12 \]
\[ 12 = 6x + 12 \]
\[ 12 - 12 = 6x \]
\[ 0 = 6x \]
\[ 0 = x \\ \frac{6}{6} \]
\[ y = 7.5 \]

16. What is the slope between the two points (8, 3) and (8, -1)?

\[ \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 3}{8 - 8} = \frac{-4}{0} \]

Undefined
<table>
<thead>
<tr>
<th>pg. #</th>
<th>Learning Targets</th>
<th>CW (teacher sign)</th>
<th>Practice assignment</th>
<th>Practice assignment (teacher sign)</th>
<th>Understanding?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>I can identify, write, and use a function for an arithmetic sequence.</td>
<td></td>
<td>2-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-8</td>
<td>I can identify, write, and use a function for a geometric sequence.</td>
<td></td>
<td>6-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-11</td>
<td>I can write an arithmetic or a geometric sequence given a word problem.</td>
<td></td>
<td>9-11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Correct mistakes

Enter answers in clicker
LT: I can write an arithmetic or a geometric sequences given a word problem.

1. What is the next number in this sequence?
   \[0.03, 0.12, 0.48, 1.92, \ldots\]
   (A) 1.95  
   (B) 3.36  
   (C) 5.08  
   (D) 7.68
   **D**

2. Which of the following is an arithmetic sequence?
   Sequence R: 1, 4, 7, 10, 13, 16, 19
   Sequence S: 1, 5, 25, 125, 625
   (A) R  
   (B) S  
   (C) R and S  
   (D) None of the above
   **A**

3. What is the next number in this sequence?
   \[2, 16, 128, 1024, \ldots\]
   (A) 1.920  
   (B) 8.192  
   (C) 11.256  
   (D) 16.384
   **B**

4. Which of these is the equation that generalizes the pattern of the data in the table?
   \[
   \begin{array}{c|c}
   x & f(x) \\
   \hline
   -3 & -5 \\
   -1 & 1 \\
   2 & 10 \\
   5 & 19 \\
   \end{array}
   \]
   (A) \(f(x) = 3x\)  
   (B) \(f(x) = x + 3\)  
   (C) \(f(x) = 2x + 6\)  
   (D) \(f(x) = 3x + 4\)
   **D**

5. As shown in the table, the monthly rent of an apartment depends on the number of bedrooms. If the pattern is extended, which of these is the likely cost of a 4-bedroom apartment?
   (A) $\$715$  
   (B) $\$725$  
   (C) $\$750$  
   (D) $\$775$
   **D**

6. During a science experiment, Kyle counted the number of bacteria present in a petri dish after every minute. Assuming the pattern continues, how many bacteria will there be after 20 minutes?
   \[
f(x) = a \cdot b^x
   \]  
   (A) \(1048576\)  
   (B) \(2097152\)  
   (C) \(320\)  
   (D) \(380\)
   **A**

7. What is the missing term in the sequence below?
   \[-110, \_\_\_, -146\]
   (A) -120  
   (B) -130  
   (C) -126  
   (D) -140
   **C**
8. Which sequence is arithmetic?

- [B] 1, 1, 2, 3, 5, 8, ...
- [C] -5
- [D] -2, 4, -6, 8, -10, ...
- [E] -27, -9, -3, -1, \( \frac{1}{3} \), ...

9. What sequence is generated by the equation \( f(x) = -2x + 7 \) for \( x = 0, 1, 2, 3, \ldots \)?

- [A] 0, 7, 14, 21, 28, ...
- [B] -2, 5, 12, 19, 26, ...
- [C] 7, 5, 3, 1, -1, -3, ...
- [D] 7, 9, 11, 13, 15, ...

10. What sequence is generated by the equation \( f(x) = 3x - 5 \) for \( x = 0, 1, 2, 3, \ldots \)?

- [A] 0, 9, 18, 27, 36, ...
- [B] -5, 4, 13, 22, 31, ...
- [C] 9, 4, -1, -6, -11, ...
- [D] -5, -14, -23, -32, -41, ...

11. What sequence is generated by the equation \( f(x) = 4x + 1 \) for \( x = 0, 1, 2, 3, \ldots \)?

- [A] 5, 6, 7, 8
- [B] -1, 0, 1, 2
- [C] 1, 5, 9, 13
- [D] 4, 5, 6, 7

12. The equation \( f(x) = 5x - 3 \) generates the arithmetic sequence -3, 2, 7, 12, 17, \ldots for \( x = 0, 1, 2, 3, \ldots \). What is the 31st term in the sequence?

- [A] 30
- [B] 147
- [C] 150
- [D] 152

13. The equation \( f(x) = -10x + 27 \) generates the arithmetic sequence 27, 17, 7, -3, -13, \ldots for \( x = 0, 1, 2, 3, \ldots \). What is the 26th term in the sequence?

- A. -287
- B. -277
- C. -233
- D. -223

14. Which equation can be used to generate the arithmetic sequence -7, -4, -1, 2, 5, 8, \ldots for \( x = 0, 1, 2, 3, \ldots \)?

- A. \( f(x) = -3x - 7 \)
- B. \( f(x) = 3x - 7 \)
- C. \( f(x) = -7x + 3 \)
- D. \( f(x) = 7x + 3 \)

15. Which equation can be used to generate the arithmetic sequence 54, 48, 42, 36, 30, \ldots for \( x = 0, 1, 2, 3, \ldots \)?

- A. \( f(x) = 54x - 6 \)
- B. \( f(x) = 6x - 54 \)
- C. \( f(x) = -6x + 54 \)
- D. \( f(x) = -6x - 6 \)

16. The equation \( f(x) = 4.2x - 3 \) represents an arithmetic sequence. What is the common difference between consecutive terms?

- A. -1
- B. 1
- C. 3
- D. 4.2

17. Which of the following best describes the arithmetic sequence 2, 5, 8, 11, 14, \ldots ?

- [X] Not a function
- [B] A linear function
- [X] A function, but not linear
- D. \( f(x) = 2x + 3 \)
18. Which sequence is geometric?
   a) 1, 1, 2, 3, 5, 8, ...
   b) 12, 7, 2, -3, -8, ...
   c) -2, 4, -8, 16, -32, ...
   d) -27, -9, -3, -1, \( \frac{1}{3} \), ...

19. What sequence is generated by the equation \( f(x) = -2(5)^x \) for \( x = 0, 1, 2, 3, \ldots \)?
   X. 5, 10, 20, 40, 80, ...
   B. -2, -10, -50, -250, -1250, ...
   C. -2, 10, -50, 250, -1250, ...
   X. -5, 10, -20, 40, -80, ...

20. What sequence is generated by the equation \( f(x) = 81(-\frac{1}{3})^x \) for \( x = 0, 1, 2, 3, \ldots \)?
   A. 81, 78, 75, 72, 69, ...
   B. -81, -27, 9, 3, 1, ...
   C. 81, 27, 9, 3, 1, ...
   D. 81, -27, 9, -3, 1, ...

21. Which equation can be used to generate the geometric sequence 3, 6, 12, 24, 48, 96, ... for \( x = 0, 1, 2, 3, \ldots \)?
   X. \( f(x) = 2(3)^x \)
   B. \( f(x) = 3(2)^x \)
   C. \( f(x) = 3(3)^x \)
   X. \( f(x) = 9(2)^x \)

22. The equation \( f(x) = 128(\frac{1}{2})^x \) generates the arithmetic sequence 128, 64, 32, 16, 8, ... for \( x = 0, 1, 2, 3, \ldots \). What is the 10\(^{th}\) term in the sequence?
   A. \( f(9) = 128(\frac{1}{2})^9 \)
   B. \( f(9) = 128(\frac{1}{2})^9 \)
   C. \( f(9) = 128(\frac{1}{2})^9 \)
   D. \( f(9) = 128(\frac{1}{2})^9 \)

23. Which sequence is geometric?
   (A) 9, 7, 5, 3, 1, ...
   (B) 0, 5, 1, 2, 4, ...
   (C) -9, -7, -5, -3, -1, ...
   (D) -4, -2, 0, 2, 4, ...

24. In the function \( f(x) = 3^x \), if a positive value of \( x \) is increased by 2, what is the effect on the value of the function?
   A. It is \( \frac{1}{3} \) the original amount.
   B. It is 6 times the original amount.
   C. It is 9 times the original amount.
   D. It is equal to the original amount.

25. Which of the following best describes the geometric sequence 2, 4, 8, 16, 32, 64, ... ?
   A. Not a function
   B. A linear function
   C. A function, but not linear
   D. \( f(x) = 2(\frac{1}{2})^x \)

26. Certain bacteria can double in number over 1 hour. Suppose a collection of 60 bacterium cells is placed in a petri dish. Which equation can be used to find how many cells, \( c \), there would be after \( x \) hours?
   A. \( c = 60x^2 \)
   B. \( c = 60(3)^x \)
   C. \( c = 2(60)^x \)
   D. \( c = 2(x)^60 \)

27. Which equation can be used to generate the arithmetic sequence 54, 18, 6, 2, \frac{2}{3}, ... for \( x = 0, 1, 2, 3, \ldots \)?
   A. \( f(x) = 54(\frac{1}{3})^x \)
   B. \( f(x) = -54(\frac{1}{3})^x \)
   C. \( f(x) = 54(-\frac{1}{3})^x \)
   D. \( f(x) = 54(\frac{2}{3})^x \)