1. Describe the relationship between the terms in the sequence 13, 26, 52, 104, … Then write the next three terms in the sequence. (Examples 1 and 2)

Each term is found by multiplying the previous term by 2; 208, 416, 832

2. Use words and symbols to describe the value of each term as a function of its position. Then find the value of the fifteenth term in the sequence. (Example 3)

Position	1	2	3	4	n
Value of Term	2	4	6	8	■

multiply the position number by 2; $2n$; 30

3. The table at the right shows the fee for overdue books at a library, based on the number of weeks the book is overdue. Write a function rule to find the fee for a book that is x weeks overdue. (Example 4) **$2x + 1$**

Weeks Overdue (x)	Fee ($)
1	3
2	5
3	7
4	9
x	■

4. **Building on the Essential Question** What is the difference between an arithmetic sequence and a geometric sequence? **Sample answer: Both are numerical patterns, but arithmetic sequences are additive and geometric sequences are multiplicative.**

Rate Yourself!

Are you ready to
Shade the section

For more help, go onl
access a Personal Tut

Independent Practice

Go online for Step-by-Step Solutions eHelp

Use words and symbols to describe the value of each term as a function of its position. Then find the value of the twelfth term in the sequence. (Examples 1–3)

1.

Position	3	4	5	6	n
Value of Term	12	13	14	15	■

add 9 to the position number; $n + 9$; 21

2.

Position	2	3	4	5	n
Value of Term	24	36	48	60	■

multiply the position number by 12; $12n$; 144

3. Describe the relationship between the terms in the sequence 6, 18, 54, 162, … . Then write the next three terms in the sequence. (Example 2)

Sample answer: This is a geometric sequence. Each term is found by multiplying the previous term by 3; 486, 1,458, 4,374

4. The table shows the amount it costs to rock climb at an indoor rock climbing facility, based on the number of hours. What is the rule to find the amount charged to rock climb for x hours? (Example 4)

$8x + 5$

Time (x)	Amount ($)
1	13
2	21
3	29
4	37
x	■

Identify Structure Determine how the next term in each sequence can be found. Then find the next two terms in the sequence.

5. 4, 16, 28, 40, ...

Show your work.

add 12; 52, 64

6. 1.5, 3.9, 6.3, 8.7, ...

add 2.4; 11.1, 13.5

7. $2\frac{1}{4}, 2\frac{3}{4}, 3\frac{1}{4}, 3\frac{3}{4}, \ldots$

add $\frac{1}{2}$; $4\frac{1}{4}$, $4\frac{3}{4}$

Find the missing number in each sequence.

8. 30, $24\frac{1}{2}$, 19, $13\frac{1}{2}$, ...

9. 43.8, 36.7, 29.6, 22.5, ...

State whether each sequence is arithmetic or geometric. Then find the next two terms in the sequence.

10. 1, 6, 36, 216

geometric sequence; 1,296, 7,776

11. 0.75, 1.75, 2.75, 3.75

arithmetic sequence; 4.75, 5.75

12. 0, 13, 26, 39

arithmetic sequence; 52, 65

13 Jay is stacking cereal boxes to create a store display. The number of boxes in each row is shown in the table. Is the pattern an example of an arithmetic sequence or a geometric sequence? Explain. How many boxes will be in row 5?

arithmetic sequence; Each term is found by adding 2 to the previous term.; 10 + 2 = 12; 12 boxes

Row	Number of Boxes
1	4
2	6
3	8
4	10
5	■

H.O.T. Problems Higher Order Thinking

14. **Reason Inductively** Create a sequence in which $1\frac{1}{4}$ is added to each number.

Sample answer: 1, $2\frac{1}{4}$, $3\frac{1}{2}$, $4\frac{3}{4}$, ...

15. **Persevere with Problems** Refer to the table below. Use words and symbols to generalize the relationship of each term as a function of its position. Then determine the value of the term when $n = 100$.

Position	1	2	3	4	5	n
Value of Term	1	4	9	16	25	■

The value of each term is the square of its position; n^2; 10,000

16. **Justify Conclusions** What is the rule to find the value of the missing term in the sequence in the table at the right? Justify your response.

4(x) − 3; Sample answer: The values 1, 5, 9, 13, and 17 increase by 4, so the rule includes 4(x). When the input is 1, the output is 1, which is 3 less than 4. So, the rule is 4(x) − 3.

Position, x	Value of Term
1	1
2	5
3	9
4	13
5	17
x	■