Name _____

6-7 Additional Practice

Geometric Sequences and Series

Is the sequence geometric? If so, write a recursive definition for the sequence.

1. 3, 9, 27, 81, …

2. 4, 8, 12, 16, ...

3. 1, 0.5, 0.25, 0.125, ...

Translate between the recursive and explicit definitions for each sequence.

4. $a_n = \begin{cases} 5, \text{ if } n = 1 \\ a_{n-1}(4), \text{ if } n > 1 \end{cases}$

5. $a_n = \frac{2}{3}(7)^{n-1}$

6. $a_n = \begin{cases} 2, \text{ if } n = 1 \\ a_{n-1}\left(\frac{3}{4}\right), \text{ if } n > 1 \end{cases}$

Write the expansion of each series. What is the sum?

7. $\sum_{n=1}^{5} 3(2)^{n-1}$

8. $\sum_{n=1}^{6} 5(3)^{n-1}$

9. $\sum_{n=1}^{4} 4\left(\frac{1}{2}\right)^{n-1}$

How many terms are in the geometric series?

10. $75 + 300 + 1200 + \ldots + 4{,}915{,}200$

11. $20 + 60 + 180 + \ldots + 1{,}180{,}980$

12. $400 + 100 + \ldots + 0.391$

13. The sum of a geometric series is 2,351,461. The first term of the series is 7 and its common ratio is 6. How many terms are in the series?

14. What is the monthly payment for a $32,000 loan for 5 years with an annual interest rate of 5.4%?

15. A geometric sequence can be used to describe the population of rabbits on a farm. The first spring, the farmer purchased 8 rabbits. Five years later, there are 648 rabbits at the farm. Assuming that none of the rabbits leave the farm, how many rabbits were on the farm in year 3?