

Section 9.3 Geometric Sequences and Series

Objective: In this lesson you learned how to recognize, write, and use geometric sequences.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Geometric sequence

Infinite geometric series or geometric series

I. Geometric Sequences (Pages 638–640)

The common ratio of a geometric sequence is . . .

What you should learn

How to recognize and write geometric sequences

The n th term of a geometric sequence has the form

_____ , where r is the common ratio of consecutive terms of the sequence. So, every geometric sequence can be written in the following form:

_____ .

A geometric sequence may be thought of as a(n) _____ function whose domain is the set of natural numbers.

Example 1: Determine whether or not the following sequence is geometric. If it is, find the common ratio.
60, 30, 0, -30, -60, . . .

To find the $(n + 1)$ th term of a geometric sequence given the n th term of the same sequence, . . .

Example 2: Write the first five terms of the geometric sequence whose first term is $a_1 = 5$ and whose common ratio is -3 .

Example 3: Find the eighth term of the geometric sequence that begins with 15 and 12.

II. The Sum of a Finite Geometric Sequence (Page 641)

The sum of the geometric sequence $a_1, a_1r, a_1r^2, a_1r^3, a_1r^4, \dots, a_1r^{n-1}$ with common ratio $r \neq 1$ is given by

_____.

When using the formula for the sum of a geometric sequence, be careful to check that the index begins with $i = 1$. If the index begins at $i = 0, \dots$

What you should learn

How to find an n th partial sum of a geometric sequence

Example 4: Find the sum $\sum_{i=1}^{10} 2(0.5)^i$.

III. Geometric Series (Page 642)

If $|r| < 1$, the sum of the infinite geometric series $a_1, a_1r, a_1r^2, a_1r^3, a_1r^4, \dots, a_1r^{n-1}, \dots$ is _____.

What you should learn

How to find the sum of an infinite geometric series

Example 5: If possible, find the sum: $\sum_{i=1}^{\infty} 9(0.25)^{i-1}$.

IV. Applications of Geometric Sequences (Page 643)

Describe a real-life problem that could be solved by finding the sum of a finite geometric sequence.

What you should learn

How to use geometric sequences to model and solve real-life problems

Homework Assignment

Page(s)

Exercises