4.4 Geometric Sequences and Series

Consider the following sequence. $\{3, 6, 12, 24, 48 \dots\}$ Write the sequence in RECURSIVE notation.

Geometric Sequences	
Recursive Formula	Explicit Formula

Example. Give the recursive and explicit notation for the geometric sequence. $\{10, 30, 90, 270 \dots\}$

        Recursive   Explicit

Practice 1) Give the recursive and explicit notation for the geometric sequence. $\{625, 125, 25, 5, 1 \dots\}$

        Recursive   Explicit

Practice 2) Write the explicit formula for the geometric sequence whose common ratio is 2 and $a_4 = 12$.

Practice 3) Two terms of a geometric sequence are $a_3 = -48$ and $a_6 = 3072$. Write an explicit formula for the sequence.

Word Problem 1. A virus reproduces by dividing into two, and after a certain growth period, it divides into two again. As the virus continues to reproduce, it will continue to divide in two. How many viruses will be in a system starting with a single virus AFTER 10 divisions?

Geometric Series

Example 1. Write each geometric series below in sigma notation.

a) $5 + 20 + 80 + 320 + \ldots + 81{,}920$

b) $15 - 30 + 60 - 120 + 240 - 480 + \cdots$