

## Geometric Sequences

**Determine if the sequence is geometric. If it is, find the common ratio.**

1)  $-1, 6, -36, 216, \dots$

2)  $-1, 1, 4, 8, \dots$

3)  $4, 16, 36, 64, \dots$

4)  $-3, -15, -75, -375, \dots$

5)  $-2, -4, -8, -16, \dots$

6)  $1, -5, 25, -125, \dots$

**Given the explicit formula for a geometric sequence find the first five terms and the 8th term.**

7)  $a_n = 3^{n-1}$

8)  $a_n = 2 \cdot \left(\frac{1}{4}\right)^{n-1}$

9)  $a_n = -2.5 \cdot 4^{n-1}$

10)  $a_n = -4 \cdot 3^{n-1}$

**Given the recursive formula for a geometric sequence find the common ratio, the first five terms, and the explicit formula.**

11)  $a_n = a_{n-1} \cdot 2$   
 $a_1 = 2$

12)  $a_n = a_{n-1} \cdot -3$   
 $a_1 = -3$

13)  $a_n = a_{n-1} \cdot 5$   
 $a_1 = 2$

14)  $a_n = a_{n-1} \cdot 3$   
 $a_1 = -3$

**Given the first term and the common ratio of a geometric sequence find the first five terms and the explicit formula.**

15)  $a_1 = 0.8, r = -5$

16)  $a_1 = 1, r = 2$

**Given the first term and the common ratio of a geometric sequence find the recursive formula and the three terms in the sequence after the last one given.**

17)  $a_1 = -4, r = 6$

18)  $a_1 = 4, r = 6$

19)  $a_1 = 2, r = 6$

20)  $a_1 = -4, r = 4$

**Given a term in a geometric sequence and the common ratio find the first five terms, the explicit formula, and the recursive formula.**

21)  $a_4 = 25, r = -5$

22)  $a_1 = 4, r = 5$

**Given two terms in a geometric sequence find the 8th term and the recursive formula.**

23)  $a_4 = -12$  and  $a_5 = -6$

24)  $a_5 = 768$  and  $a_2 = 12$

25)  $a_1 = -2$  and  $a_5 = -512$

26)  $a_5 = 3888$  and  $a_3 = 108$

## Finite Geometric Series

Evaluate the related series of each sequence.

1) 2, 12, 72, 432

2) -1, 5, -25, 125

3) -2, 6, -18, 54, -162

4) -2, -12, -72, -432, -2592

Evaluate each geometric series described.

5)  $\sum_{k=1}^7 4^{k-1}$

6)  $\sum_{i=1}^8 (-6)^{i-1}$

7)  $\sum_{i=1}^9 2^{i-1}$

8)  $\sum_{m=1}^9 -2^{m-1}$

9)  $\sum_{n=1}^8 2 \cdot (-2)^{n-1}$

10)  $\sum_{n=1}^9 4 \cdot 3^{n-1}$

11)  $\sum_{n=1}^{10} 4 \cdot (-3)^{n-1}$

12)  $\sum_{n=1}^9 (-2)^{n-1}$

13)  $1 + 2 + 4 + 8\dots, n = 6$

14)  $2 - 10 + 50 - 250\dots, n = 8$

15)  $1 - 4 + 16 - 64\dots, n = 9$

16)  $-2 - 6 - 18 - 54\dots, n = 9$

17)  $1 - 5 + 25 - 125\dots, n = 7$

18)  $-3 - 6 - 12 - 24\dots, n = 9$

19)  $a_1 = 4, a_n = 1024, r = -2$

20)  $a_1 = 4, a_n = 8748, r = 3$

**Determine the number of terms  $n$  in each geometric series.**

21)  $a_1 = -2, r = 5, S_n = -62$

22)  $a_1 = 3, r = -3, S_n = -60$

23)  $a_1 = -3, r = 4, S_n = -4095$

24)  $a_1 = -3, r = -2, S_n = 63$

25)  $-4 + 16 - 64 + 256\dots, S_n = 52428$

26)  $\sum_{m=1}^n -2 \cdot 4^{m-1} = -42$