

## Geometric Sequences

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

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

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

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

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

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

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

6)  $a_1 = 1, r = 2$

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

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

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

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

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

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

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

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

**Answers****Geometric Sequences**

- 1)  $r = -5$
- 2)  $r = 2$
- 3) not geometric
- 4)  $r = 5$
- 5) First Five Terms: 0.8, -4, 20, -100, 500  
Explicit:  $a_n = 0.8 \cdot (-5)^{n-1}$
- 6) First Five Terms: 1, 2, 4, 8, 16  
Explicit:  $a_n = 2^{n-1}$
- 7) Common Ratio:  $r = 2$   
First Five Terms: 2, 4, 8, 16, 32  
Explicit:  $a_n = 2 \cdot 2^{n-1}$
- 8) Common Ratio:  $r = -3$   
First Five Terms: -3, 9, -27, 81, -243  
Explicit:  $a_n = -3 \cdot (-3)^{n-1}$
- 9) Common Ratio:  $r = 5$   
First Five Terms: 2, 10, 50, 250, 1,250  
Explicit:  $a_n = 2 \cdot 5^{n-1}$
- 10) Common Ratio:  $r = 3$   
First Five Terms: -3, -9, -27, -81, -243  
Explicit:  $a_n = -3 \cdot 3^{n-1}$
- 11)  $a_8 = \frac{3}{4}$ , Recursive:  $a_n = a_{n-1} \cdot \frac{-1}{2}$ ,  $a_1 = -96$
- 12)  $a_8 = 49,152$ , Recursive:  $a_n = a_{n-1} \cdot 4$