

# Geometric Sequences Worksheet

Determine whether each of the following sequences is arithmetic, geometric, or neither. Explain your decisions.

1)  $-4, 1, 6, 11, \dots$

2)  $2, 8, 32, 128, \dots$

3)  $1.5, 4.5, 13.5, 40.5, \dots$

For each of the following geometric sequences, find the common ratio. Then write the explicit formula for the sequence.

4)  $10, 20, 40, 80, \dots$

5)  $7, -7, 7, -7, \dots$

6)  $3, -12, 48, -192, \dots$

7)  $162, 108, 72, 48, \dots$

8)  $100, 50, 25, 12.5, \dots$

9) Show work: What is the 14<sup>th</sup> term of the geometric sequence:  $3, 9, 27, 81, \dots$

10) Show work: What is the 11<sup>th</sup> term of the geometric sequence:  $-2, 10, -50, 250, \dots$

11) Lidia's parents have offered her two different options to earn her allowance for a 9-week period over the summer. She can either get paid \$30 each week, or \$1 the first week, \$2 the second week, \$4 the third week, and so on.

a) Clearly explain if the second option forms a geometric sequence or not.

b) Show work and explain which option Lidia should choose.

12) Gabe and Erik are finding the 9<sup>th</sup> term of the geometric sequence  $-5, 10, -20, \dots$

Is either of them correct? Explain.

**Gabe**

$$\begin{aligned} r &= \frac{10}{-5} = -2 \\ a_9 &= -5(-2)^{9-1} \\ &= -5(512) \\ &= -2560 \end{aligned}$$

**Erik**

$$\begin{aligned} r &= \frac{10}{-5} = -2 \\ a_9 &= -5(-2)^{9-1} \\ &= -5(-256) \\ &= 1280 \end{aligned}$$

**Precalculus**  
**Geometric Sequences and Series**  
**Worksheet #1**

Name \_\_\_\_\_

**Determine the common ratio, and find the next three terms of each geometric sequence.**

1)  $\frac{1}{2}, -\frac{3}{8}, \frac{9}{32}, \dots$

2) 8, 20, 50, ...

3)  $2x, 10x, 50x, \dots$

**Write an explicit formula**  
**sequence.**

**for finding the  $n$ th term of each geometric**

4) 64, 16, 4, ...

5) 4, -12, 36, ...

6) 20, 30, 45, ...

**Find the specified term for each geometric sequence or sequence with the given characteristics.**

7)  $a_9$  for 60, 30, 15, ...

8)  $a_4$  for 7, 14, 28, ...

9)  $a_7$  if  $a_3 = 24$  and  $r = -0.5$

10)  $a_8$  if  $a_1 = 4096$  and  $r = \frac{1}{4}$

11) Find the sixth term of a geometric sequence with a first term of 9 and a common ratio of 2.

12) If  $r = 4$  and  $a_8 = 100$ , what is the first term of the geometric sequence?