

# Geometric Sequences

## Algebra 1 • Section 4.6

Name: \_\_\_\_\_

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### Quick Review and Helpful Hints

A function pairs each input with exactly one output. Pay attention to what the input means, what rule is being applied, and whether the question asks for a value, a rule, a domain, or an interpretation.

▷ **Example:** For  $f(x) = 2x + 5$ , find  $f(4)$ .

**Work:** Replace  $x$  with 4:  $f(4) = 2(4) + 5 = 13$ .

★ **Answer:** 13

### ◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Find the next three terms: 3, 6, 12, ...

6. Find  $a_5$  for 81, 27, 9, ...

2. Find the common ratio of 80, 40, 20, 10, ...

7. Write a recursive rule for 6, 18, 54, ...

3. Find  $a_n$  for 5, 15, 45, ...

8. Which term of 2, 6, 18, ... is 162?

4. Find  $a_6$  if  $a_1 = 4$  and  $r = 2$ .

9. Find the next term after 1000, 200, 40, 8.

5. Is 2, 5, 10, 17, ... geometric?

10. Find  $a_n$  if  $a_1 = 12$  and  $r = -2$ .

### ◆ Word Problems

11. A bacteria culture starts at 400 and doubles each hour. Write the amount after  $h$  hours.

12. A car loses 15% of its value each year. Write the multiplier.



## Answer Keys

- |                            |                              |
|----------------------------|------------------------------|
| 1. $24, 48, 96$            | 7. $a_1 = 6; a_n = 3a_{n-1}$ |
| 2. $\frac{1}{2}$           | 8. 5th                       |
| 3. $a_n = 5 \cdot 3^{n-1}$ | 9. 1.6                       |
| 4. 128                     | 10. $a_n = 12(-2)^{n-1}$     |
| 5. No                      | 11. $400 \cdot 2^h$          |
| 6. 1                       | 12. 0.85                     |

### Step-by-Step Explanations

- Here you multiply, not add — each term doubles, so keep timesing by 2.
- Every term is half the one before, so the ratio that links them is  $\frac{1}{2}$ .
- Begin at 5 and triple repeatedly; the exponent counts how many triples you've done.
- To reach term 6 you double 5 times:  $4 \cdot 2^5$  climbs to 128.
- Dividing consecutive terms gives different ratios, and geometric sequences need one steady multiplier.
- You're cutting by  $\frac{1}{3}$  each step; after 4 cuts from 81 you whittle down to 1.
- Kick off at 6, and to get any term just triple the one sitting right before it.
- Tripling along the way: 2, 6, 18, 54, 162 — and 162 lands in the 5th seat.
- Each term is one-fifth of the last, so 8 shrinks to  $8 \cdot \frac{1}{5} = 1.6$ .
- Same geometric template: first term 12, ratio  $-2$ , and that negative makes the signs flip-flop.
- At hour zero you've got 400, then doubling every hour means multiplying by 2 another  $h$  times.
- If 15% walks away, 85% stays behind — so each year you multiply by 0.85.



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