

# Geometric Sequences

## Algebra 1 • Section 4.6

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

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 12

### 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. <input type="text" value="24, 48, 96"/>  | 7. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="a_1 = 6; a_n = 3a_{n-1}"/> |
| 2. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="1/2"/>                   | 8. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="5th"/>                     |
| 3. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="a_n = 5 \cdot 3^{n-1}"/> | 9. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="1.6"/>                     |
| 4. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="128"/>                   | 10. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="a_n = 12(-2)^{n-1}"/>     |
| 5. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="No"/>                    | 11. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="400 \cdot 2^h"/>          |
| 6. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="1"/>                     | 12. <input style="font-family: monospace; font-size: 0.9em; border: 1px solid black; padding: 2px; border-radius: 5px; width: 100%;" type="text" value="0.85"/>                   |

### Step-by-Step Explanations

- |  |   |
|--|---|
| <p>1. Here you multiply, not add — each term doubles, so keep timesing by 2.</p> <p>2. Every term is half the one before, so the ratio that links them is <math>\frac{1}{2}</math>.</p> <p>3. Begin at 5 and triple repeatedly; the exponent counts how many triples you've done.</p> <p>4. To reach term 6 you double 5 times: <math>4 \cdot 2^5</math> climbs to 128.</p> <p>5. Dividing consecutive terms gives different ratios, and geometric sequences need one steady multiplier.</p> <p>6. You're cutting by <math>\frac{1}{3}</math> each step; after 4 cuts from 81 you whittle down to 1.</p> | <p>7. Kick off at 6, and to get any term just triple the one sitting right before it.</p> <p>8. Tripling along the way: 2, 6, 18, 54, 162 — and 162 lands in the 5th seat.</p> <p>9. Each term is one-fifth of the last, so 8 shrinks to <math>8 \cdot \frac{1}{5} = 1.6</math>.</p> <p>10. Same geometric template: first term 12, ratio <math>-2</math>, and that negative makes the signs flip-flop.</p> <p>11. At hour zero you've got 400, then doubling every hour means multiplying by 2 another <math>h</math> times.</p> <p>12. If 15% walks away, 85% stays behind — so each year you multiply by 0.85.</p> |
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