

Geometric Sequences

TSIA2 Math • 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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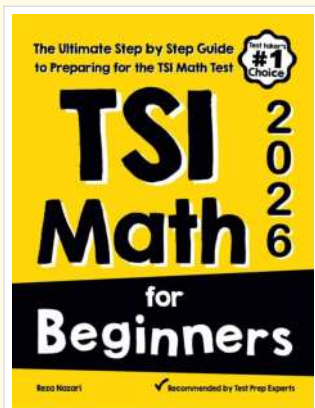
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