Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Identifying Geometric Sequences

Identifying Geometric Sequences | A1-U07-P09

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for compatible ratio set, set of compatible ratios, ratio in exact form, common ratio, geometric decision and ratio and three indexed terms.

8 PDFs and a README; 59 buyer pages.

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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Algebra 1

Identifying Geometric Sequences

Name: _____ **Date:** _____ **Class:** _____

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

For $n = 1, 2, 3, 4$, a sequence has terms $2, 6, 18, 54$. Is the displayed sequence geometric? If so, give the common ratio. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Index n	Given term
1	2
2	6
3	18
4	54

Bank label: _____

Determine whether $80, 40, 20, 10$ has a constant multiplicative step. State that step as a common ratio. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Bank label: _____

Does the finite sequence $7, -7, 7, -7, 7$ have one common ratio? Explain the alternating signs. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Bank label: _____

At indices 3 through 6, the terms are $-4, 8, -16, 32$. Decide whether these consecutive terms are geometric and identify r. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Index n	Given term
3	-4
4	8
5	-16
6	32

Bank label: _____

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Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

A table gives $a_0 = -5$, $a_1 = -15$, $a_2 = -45$, and $a_3 = -135$. Test every transition for a common ratio.

Index n	Given term
0	-5
1	-15
2	-45
3	-135

The first four terms in a table are $-81, -27, -9, -3$. Are they geometric, and why do the terms remain negative?

Index n	Given term
1	-81
2	-27
3	-9
4	-3

A table lists $3, 12, 48, 193$ at consecutive indices. Test the geometric claim and identify the first transition that fails.

Index n	Given term
1	3
2	12
3	48
4	193

A table starts at $n = 4$ with $a_4 = 9$, $a_5 = 27$, $a_6 = 81$, and $a_7 = 243$. Does the nonunit starting index affect the common-ratio test?

Index n	Given term
4	9
5	27
6	81
7	243

Observed terms at $n = 1$ through 4 are $4, 12, 36, 108$. State the common ratio supported by these data, then explain what the finite table does not prove about later terms.

At four consecutive indices the terms are $2, -4, 8, -15.5$. Test the proposed geometric pattern, locate the failure, and state the term that would preserve the earlier ratio.

Index n	Given term
5	2
6	-4
7	8
8	-15.5

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Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

START

The entries $\frac{5}{2}$, $\frac{5}{4}$, $\frac{5}{8}$, and $\frac{5}{16}$ are consecutive terms. Verify or reject the claim that they form a geometric sequence. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Your response: _____

Incoming: The common ratio is $-\frac{2}{3}$.

Assume $4, 12$ begin a geometric sequence. Find the next term. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Your response: _____

Incoming: Yes; $r = 2$.

A table row reads $243, 81, 27, 9$ at consecutive indices. Determine its common ratio. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Your response: _____

Incoming: $48, -6$

A geometric sequence has $a_2 = 1.2$ and $a_3 = 6$. Determine a_4 from the ratio in the table. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Index n	Given term
2	1.2
3	6

Your response: _____

Incoming: The sequence is geometric with $r = -\frac{1}{2}$.

A geometric sequence has $a_1 = 3$ and $a_2 = 6$. Find a_3 and a_4. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Index n	Given term
1	3
2	6

Your response: _____

Incoming: $r = \frac{1}{5}$

Use exact fraction arithmetic to test $\frac{3}{2}, -1, \frac{2}{3}, -\frac{4}{9}$ for one common ratio. Use the complete originally requested ratio or ordered list of terms as the matching response, keeping each requested position and the original geometric-assumption scope. Provide the original verification.

Your response: _____

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Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

The geometric sequence $5, 15, \_\_\_\_, 135$ has one missing term. Recover it and verify both neighboring transitions. Choose a recovery method justified by the given positions: use a quotient of known adjacent nonzero terms, or use the multiplicative relation across an index gap. Explain which information supports your choice, apply it, and check every possible ratio or missing term against the original sign and geometric conditions.

A real geometric sequence has consecutive terms $64, x, 16$. Find every possible x and the corresponding common ratio. Choose a recovery method justified by the given positions: use a quotient of known adjacent nonzero terms, or use the multiplicative relation across an index gap. Explain which information supports your choice, apply it, and check every possible ratio or missing term against the original sign and geometric conditions.

Identifying Geometric Sequences

Full Worked Solutions - excerpt

Worked example

Problem. Starting with $a_9 = 125$, apply $r = \frac{1}{5}$ to complete a_{10} and a_{11}.

Answer. $a_{10} = 25$ and $a_{11} = 5$.

Explanation and check.

Successive division by 5 produces 25 and 5.

Worked example

Problem. Given $a_3 = 1$ and $r = -4$, supply the next two entries.

Answer. $a_4 = -4$ and $a_5 = 16$.

Explanation and check.

Multiply by -4 twice: 1 becomes -4, then 16.