

CH. 4, L1 – ARITHMETIC AND GEOMETRIC SEQUENCES

Objective: Given a function pattern, I will distinguish between arithmetic and geometric sequences by identifying the growth rate/factor.

Think About It: Given the sequences below, annotate both for how they are changing and determine the next three terms in the sequence.

1, 3, 5, 7, _____, _____, _____

In words _____

1, 3, 9, 27, _____, _____, _____

In words _____

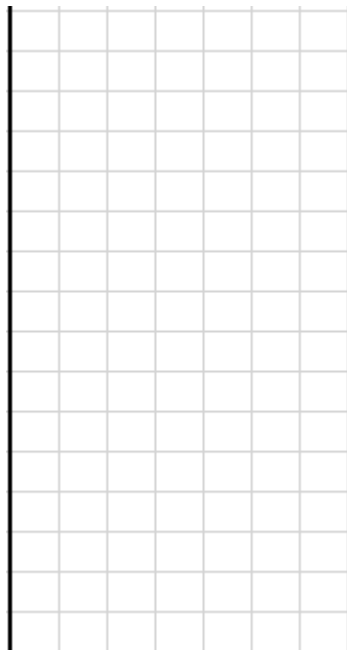
Keywords: *sequence, growth factor, growth rate*

Big Idea:

1. Sequences are annotated w/ common difference or ratio
2. Sequences are annotated with common difference and ratio to determine geometric vs. arithmetic

Interaction with New Material:

Ex. 1) A sequence starts with the terms 1, and 2. Graph the first 5 terms of the sequence if it is arithmetic and if it is geometric on the same graph provided.



Ex. 2) Water is draining out of a water tank and the volume of the tank is recorded every minute. Would the change in volume of the water tank be best described as arithmetic or geometric?

Time (minutes)	Volume (gallons)
0	400
1	335
2	271
3	205
4	140
5	74

Partner Practice: (*Low Difficulty*)

1. Annotate and determine if the following sequences are arithmetic or geometric. Identify the common difference or common ratio.

a. 5, 10, 15, 20, 25, 30	b. 5, 10, 20, 40, 80, 160
c. 1024, 256, 64, 16, 4	d. 1024, 256, -512, -1280

2. A sequence starts off with the first two terms 2, and 6. Determine the next four terms if:

a. The sequence is arithmetic	b. The sequence is geometric
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Partner Practice: (*Medium Difficulty*)

3. A bank account starts with \$250. Each month the balance is recorded. The following are balances of the account for the next 4 months:

\$312.50, \$390.63, \$488.29, \$610.36

Is the account growing arithmetically or geometrically? What will be the value of the account next month? Justify your answer.

4. Martin says that he can't tell if the sequence 2, 4, ... is arithmetic or geometric. Gloria says that it is clearly arithmetic because to go from 2 to 4, you have to add 2 so the next term is 6. Explain who is correct and why the other person is incorrect.

5. The table below shows the distances that Margo ran every day for a week while training for a marathon. Would you describe her training as being more arithmetic or geometric? How far would you expect her to run for the next three days? Explain

Training Day	Miles Ran
1	7.5
2	8.64
3	9.81
4	10.96
5	12.11
6	13.25
7	14.41

6. A sequence starts with the terms 1, and 3. What is the difference in the average of the first five terms of the sequence for an arithmetic sequence vs. a geometric sequence?

- Sequences are annotated w/ common difference or ratio
- Sequences are annotated with common difference and ratio to determine geometric vs. arithmetic

Partner Practice: (*Hard Difficulty*)

7. What are the next three terms in the sequence below? Determine if the sequence is arithmetic, geometric, or neither and explain what the rule is.

1, 1, 2, 3, 5, 8, 13, 21, ...

8. A sequence is defined recursively as $a(1) = 4$, $a(n) = 5 \cdot a(n - 1)$. Does it represent an arithmetic or geometric sequence? Create a sequence with this rule and prove your answer is correct.

CFS

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2. Sequences are annotated with common difference and ratio to determine geometric vs. arithmetic