

Sequence Application – Warm-up

Name: Colan Rules! Date: _____ Period: _____

Fill in the blanks with the missing terms of the sequences.

1. 5, 10, 15, 20, 25, 30, 35, 40
2. 1, 11, 21, 31, 41, 51, 61, 71, 81
3. 20, 10, 0, -10, -20, -30, -40, -50, -60
4. -2, -4, -8, -16, -32, -64, -128, -256

Suppose $a_5 = 12$, $a_6 = 19$, and $a_7 = 26$.

5. Identify a_1 . -16 -16-9-25, 12, 19, 26
6. Write an explicit rule for this sequence.

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Fill in the blanks with the missing terms of the sequences.

1. 5, _____, 15, 20, _____, 30, 35, _____
2. 1, _____, _____, _____, 41, 51, 61, 71, _____
3. 20, 10, _____, _____, _____, _____, -40, -50, _____
4. -2, -4, _____, _____, _____, -64, -128, _____

Suppose $a_5 = 12$, $a_6 = 19$, and $a_7 = 26$.

5. Identify a_1 . _____
6. Write an explicit rule for this sequence.

Recursive Rule

What is the question you have been asked?
-16, -9, -2, 5, 12, 19, 26

Fill in what you know:
 $a_1 = -16$
 $d = +7$
 ~~$a_n =$~~
 ~~$n =$~~

Don't know d → DONE!
Know d

Is the sequence arithmetic or geometric?

What is the general formula for the type of sequence in this problem?
 $a_n = a_1 + d(n-1)$

Don't know a_1
Substitute numeric values into general formula and solve for a_1 .
 $a_n = a_1 + d(n-1)$

Know a_1
Substitute numeric values for d and a_1 into formula and simplify.
 $a_n = -23 + 7n$
Explicit formula:

Geometric Sequences

Class Goals – By the end of the period, you will understand and be able to...

- Define geometric sequences.
- Identify and Extend geometric sequences.

What is a geometric sequence?

when the same number is multiplied or divided repeatedly (it has to be constant)

a. 1, 2, 4, 8, 16, ... 32, 64, 128, ...

b. 128, 160, 200, ...

Finding r (Recursive Rule)

$$\frac{160r}{160} = \frac{200}{160}$$

$$r = 1.25$$

or
1.25

Explicit Rule for Geometric Sequences

$$g_n = g_0(r)^n \text{ or } g_n = g_1(r)^{n-1}$$

$$1\frac{1}{4}$$

Example #1 Identify what is being multiplied or divided repeatedly. What are the next 3 terms of the geometric sequences?

c. 4, 12, 36, 108, ...

$$g_n = \frac{4}{3}(3)^n \text{ or } g_n = 4(3)^{n-1}$$

d. 81, 27, 9, 3, ...

$$g_n = 243\left(\frac{1}{3}\right)^n$$

e. -2, -6, -18, -54, ...

f. 15, -30, 60, -120, ...

g. 4, 2, 1, $\frac{1}{2}$, $\frac{1}{4}$, ...

Geometric Sequences

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- Define geometric sequences.
- Identify and Extend geometric sequences.

What is a geometric sequence?

when the same number is multiplied or divided repeatedly (it has to be constant)

a. 1, 2, 4, 8, 16, ... 32, 64, 128, ...

b. 128, 160, 200, ...

Multiply the previous term by 2

Multiply the previous term by $\frac{5}{4}$

Finding r (Recursive Rule)

$$\frac{160r}{160} = \frac{200}{160}$$

$$r = 1.25$$

or 1.25

Explicit Rule for Geometric Sequences

$$g_n = g_0(r)^n \text{ or } g_n = g_1(r)^{n-1}$$

$$\frac{1}{4}$$

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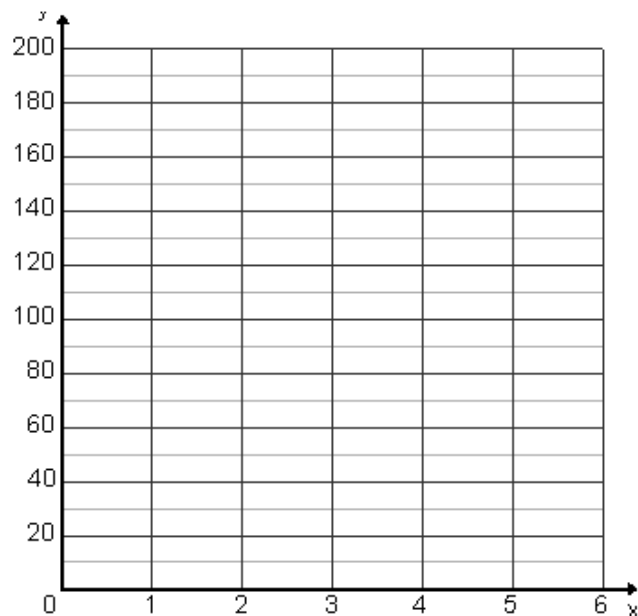
Example #2 Identify the next 2 terms of 5, 10, 20, 40, ...

a. Identify the recursive rule for this sequence?

b. Write an explicit rule for this sequence.

c. Create a table of the first 6 terms.
Then graph. Label your axes.

#	Term
1	5
2	10
3	20
4	40
5	
6	



d. Use the recursive rule to find the 9th term of this sequence?

e. Use the explicit rule to find the 18th term of this sequence?

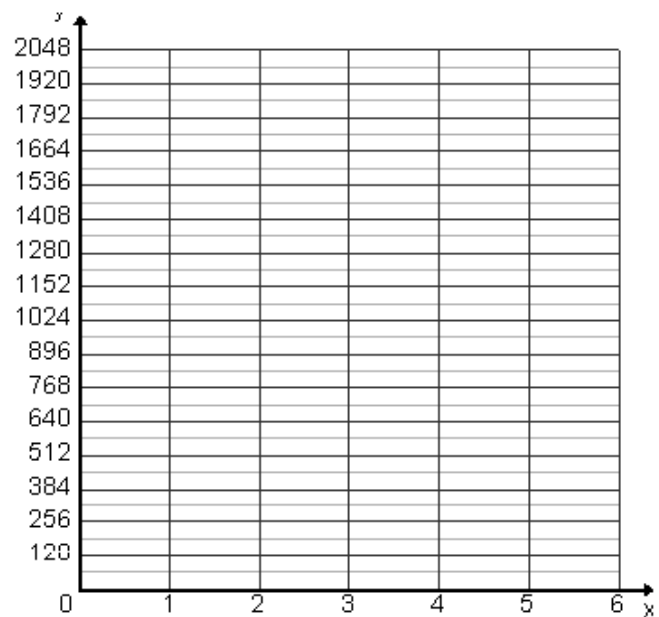
1. Identify the next 2 terms of 2048, 512, 128, ...

a. Identify the recursive rule for this sequence?

b. Write an explicit rule for this sequence.

c. Create a table of the first 5 terms.
Then graph. Label your axes.

#	Term
1	2048
2	512
3	128
4	
5	



d. Use the recursive rule to find the 8th term of this sequence.

e. Use the explicit rule to find the 11th term of this sequence.

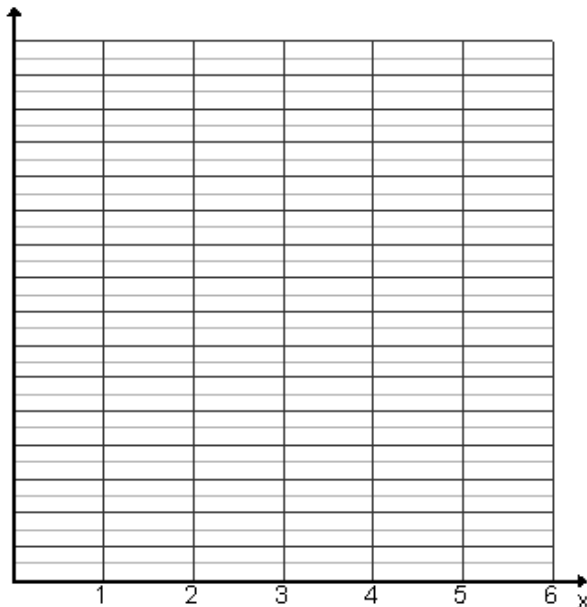
2. Create your own geometric sequence.

a. *Identify the recursive rule for this sequence?*

b. *Write an explicit rule for this sequence.*

c. *Create a table of the first 6 terms.
Then graph. Label your axes.*

#	Term
1	
2	
3	
4	
5	
6	



d. *Use the recursive rule to find the 8th term of this sequence.*

e. *Use the explicit rule to find the 24th term of this sequence.*

