

# 6.2 Recursive Formulas for Sequences

## ALGEBRA

Write your questions here!



SMP #8

Ex 1:

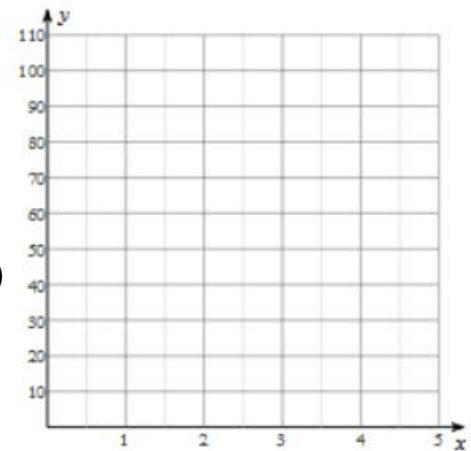
- a) What's the next number in the sequence?
- b) Justify your reasoning

Recursive Formula:

What's the recursive formula for the sequence in Ex 1?

Ex 2: Consider the following sequence:

- a) What's the next term?
- b) What's the recursive formula for the sequence?
- c) Graph the terms of the sequence as an ordered pair  $(n, G_n)$
- d) What kind of graph does it form?



Types of Sequences

Arithmetic Sequence:

Geometric Sequence:

Which type of sequence is Ex 1? Ex 2?

Ex 3: Consider the following sequence:

- a) What are the next three terms?
- b) What is the recursive formula for this sequence?
- c) Is the sequence geometric or arithmetic? Why?
- d) Describe what the graph will look like using complete sentences.

Ex 4: Consider the following graph as a sequence plotted by  $(n, B(n))$ .

a) Is this sequence arithmetic or geometric? Why?

b) What is the recursive formula for this sequence?

You Try!

Consider the following sequence:

a) What are the next three terms?

b) What is the recursive formula for this sequence?

c) Is the sequence geometric or arithmetic? Why?

d) Describe what the graph will look like using complete sentences.

## SUMMARY:

Now,  
summarize  
your notes  
here!

## 6.2 Recursive Formulas for Sequences

## PRACTICE

**Directions: 1-3: Choose the best recursive formula for the following sequence.**

1) 40, 32, 24, 16

- a)  $G(n) = G(n - 1) \times 8$
- b)  $G(n) = G(n - 1) + 8$
- c)  $G(n) = G(n - 1) - 8$
- d)  $G(n) = G(n - 1) \times -8$

2) -3, -6, -12, -24

- a)  $h_n = h \times -2$
- b)  $h_n = h - 2$
- c)  $h_{n-1} = h_n \times 2$
- d)  $h_n = h_{n-1} \times 2$

3) 1, 1, 2, 3, 5, 8, 13

- a)  $b_n = b_{n-1} + b_n$
- b)  $b_n = b_{n-2} + b_{n-1}$
- c)  $b_n = b_{n+1} + b_{n+2}$
- d)  $b_n = b_n + b_n$

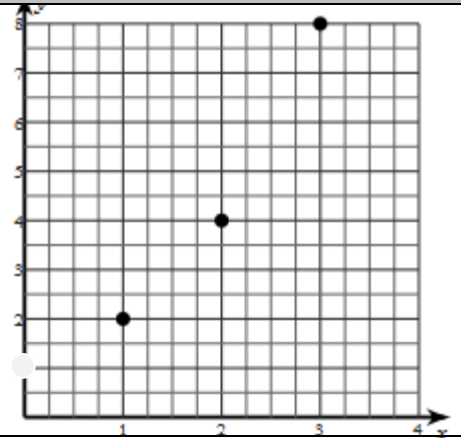
**Directions: 4-5: Consider the following graph as a sequence plotted by  $(n, B(n))$ .**

4)

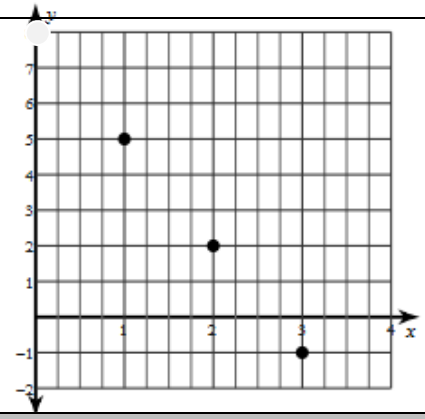
a) Is this an arithmetic or geometric sequence? How do you know?

b) What is the recursive formula for this sequence?

c) What are the next three terms?



- 5)  
 a) Is this an arithmetic or geometric sequence? How do you know?  
 b) What is the recursive formula for this sequence?  
 c) What are the next three terms?



**Directions: 6-10: Use the sequence to answer each of the questions.**

6) 4, 15, 26, 37

- a) What are the next three terms?  
 b) What is the recursive formula for this sequence?  
 c) Is the sequence geometric or arithmetic? Why?  
 d) Describe what the graph will look like using complete sentences.

7) 98, 89, 80, 71

- a) What are the next three terms?  
 b) What is the recursive formula for this sequence?  
 c) Is the sequence geometric or arithmetic? Why?  
 d) Describe what the graph will look like using complete sentences.

8) 200, 100, 50, 25


- a) What are the next three terms?  
 b) What is the recursive formula for this sequence?  
 c) Is the sequence geometric or arithmetic? Why?  
 d) Describe what the graph will look like using complete sentences.

9) 1.25, 2.75, 4.25, 5.75

- a) What are the next three terms?  
 b) What is the recursive formula for this sequence?  
 c) Is the sequence geometric or arithmetic? Why?  
 d) Describe what the graph will look like using complete sentences.

10) -5, -15, -45, -135

- a) What are the next three terms?  
 b) What is the recursive formula for this sequence?  
 c) Is the sequence geometric or arithmetic? Why?  
 d) Describe what the graph will look like using complete sentences.

<b>Directions: Solve the equation. Put your solution into set notation.</b>	<b>Circle all the ordered pairs <math>(x, y)</math> that are solutions to the given equation.</b>
11) $-1 = \frac{r-1}{2} - 5$	12) $7y - 2x = -1$  (11, 3)   (0, 1)   (1, -8)   (-5, 1)   (4, 1)
<b>Directions: Find the product.</b>	<b>Directions: Solve each inequality. Express the solution graphically and in set notation.</b>
13) $(3k - 1)(3k^2 - 11k - 8)$	14) $92 > -4(x - 9)$  

## 6.2 Recursive Formulas for Sequences

## WRAP UP

Direction: Use the sequence to answer the following: 4, 6, 9, 13.5, 20.25			
1) What are the next three terms?	2) What is the recursive formula for this sequence?	3) Is the sequence geometric or arithmetic? Why?	4) Describe what the graph will look like using complete sentences.

Directions:

For each situation tell whether the situation is best modeled by a GEOMETRIC or ARITHMETIC sequence. Then come up with the RECURSIVE FORMULA and the first FOUR terms.

5) Your “friend” promises you that he cans DOUBLE your money every year if you invest with him. You decide to give him \$100 to try it out.

GEO/ARITH/NEITHER and WHY:

**SMP #4**

RECURSIVE FORMULA:

1<sup>st</sup> FOUR TERMS:

6) You decide to put \$2 in a jar each week to see how much money you can save. Your mom thinks it's a great idea and decides to give you \$10 to start.

GEO/ARITH/NEITHER and WHY:

RECURSIVE FORMULA:

1<sup>st</sup> FOUR TERMS:

7) Your parents decide to start a college fund for you. Every month they are going to put \$250 in the account and the investment firm tells them that they can expect their money to grow 1.05 times each month. They start by putting in \$1000 into the account.

GEO/ARITH/NEITHER and WHY:

RECURSIVE FORMULA:

1<sup>st</sup> FOUR TERMS:

### EXIT TICKET –

Mr. Brust is sponsoring this year's most up-and-coming club at his school "Capris, Manpris and Skis". The club is raising money so that they can go skiing in the Alps in March. To motivate his students he tells them that each month they DOUBLE the funds they've raised he'll add \$50 to the fund.

- a) Assuming the club achieves their goal of doubling their fundraising each month what is a recursive formula where  $M(n)$  represents the money in the account at the beginning of the  $n$ th month.
  
- b) What is the least amount of money the club could have started with in order to have \$750 in their account after 4 months?