

Content and Language Objective:

SWBAT write recursive routines for number sequences and be able to explain their process using the mathematic terms; common difference, constant multiplier, common ratio and recursive routines.

Lesson 29: Recursive Routines

Date: November 30, 2015

Warm - Up

Find the solution to the given system

1. $y = 3x - 2$
 $y = -4x - 16$

$$\begin{array}{r} 3(-2) - 2 \\ -6 - 2 \\ \hline y = -8 \end{array}$$

$$\begin{array}{r} 3x - 2 = -4x - 16 \\ +4x + 2 \quad +4x + 2 \\ \hline 7x = -14 \\ \div \\ x = -2 \end{array}$$

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Look at the sequence below.

1,3,5,7, ...

1 3 5 7
1st term 2nd term 3rd term 4th term

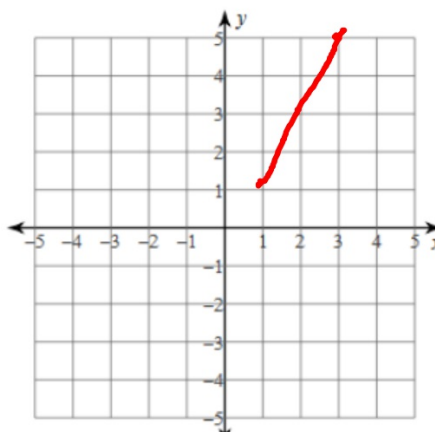
What is the starting value? 1

What is the sequence changing by? +2

Each number in the sequence is a **term**.

Create a table to model the situation. Graph it!

x	y
term	value
1	1
2	3
3	5
4	7



What kind of pattern do you get?

linear

Equation: $y = x + 2$

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Look at the sequence below.

1,2,4,8, ...

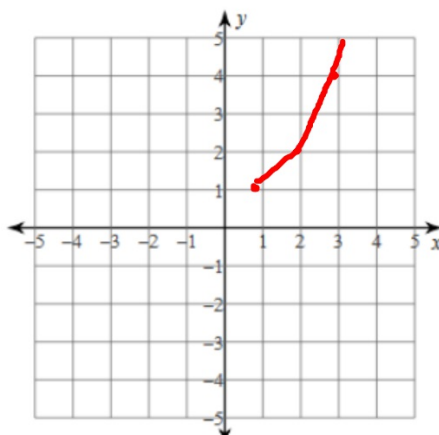
What is the starting value? 1

What is the sequence changing by? $\times 2$

Each number in the sequence is a **term**.

Create a table to model the situation. Graph it!

term	value
1	1
2	2
3	4
4	8



What kind of pattern do you get?

exponential

Equation: 2^x

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In a arithmetic sequence, when we find out what a pattern is changing by it is called finding the common difference. (linear) + or -

In a geometric sequence, when we find out what a pattern is changing by it is called finding the common ratio. (exponential) \times or \div

Another **term** that we use is a constant multiplier, which is the value that is used to repeat a multiplication sequence it is also known as repeated multiplication.

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When finding a recursive routine using a common difference we use our knowledge of adding and subtracting to help us find the common difference.

3, 8, 13, 18, ...

Starting Value:_____

Operation:_____

Equation:_____

15,9,3,-3,...

Starting Value:_____

Operation:_____

Equation:_____

When finding a recursive routine using a constant multiplier we use our knowledge of reducing and undoing operations to help us find the multiplier.

2, 6, 18, 54, ...

Starting Value:_____

Operation:_____

Equation:_____

243, 81, 27, ...

Starting Value:_____

Operation:_____

Equation:_____

