

Cornell Notes



Topic/Objective: 6.2 Arithmetic
sequences

Name:

Class/Period: 4

Date: 4/14/17

Essential Question:

How is an arithmetic sequence special?

Questions:

Notes:

vocab

- A sequence is a list of members written in a definite order

the sequence $\{a_1, a_2, a_3, a_4, \dots, a_n, \dots\}$

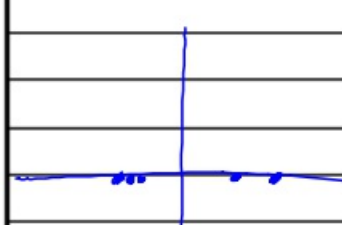
is denoted $\{a_n\}$

or $\{a_n\}_{n=1}^{\infty}$

where $n \in \mathbb{N}^+$

a recursive formula allows one to describe a term's value and is dependent upon the value of a previous term

a general formula for the n^{th} term allows one to find the value of a term without depending on a previous term.

Questions:	Notes: EXAMPLES		
	<u>SEQUENCE</u>	<u>Recursive Formula</u>	<u>General Formula</u>
$n =$ 	$\{3, 6, 9, 12, \dots\}$	$a_n = a_{n-1} + 3$ OR $a_{n+1} = a_n + 3$	$a_n = 3n$
	$\{1, 1, 2, 3, 5, 8, \dots\}$ Fibonacci	$f_1 = 1$ $f_2 = 2$ $f_n = f_{n-1} + f_{n-2}$	<u>General Formula</u>
		$F_n = \frac{1}{\sqrt{5}} \left(\frac{1+\sqrt{5}}{2} \right)^{n+1} - \frac{1}{\sqrt{5}} \left(\frac{1-\sqrt{5}}{2} \right)^{n+1}$	
	<u>FINDING A GENERAL RULE FOR SEQUENCE</u>		
multiplied by $\frac{1}{5}$ numerator ↑	Ex) Find a formula for the n^{th} term a_n for the sequence $\left\{ \frac{3}{5}, \frac{-4}{25}, \frac{5}{125}, \frac{-6}{625}, \frac{7}{3125}, \dots \right\}$ Alternating Sequence IF a_n is positive use $(-1)^{n-1}$ or $(-1)^{n+1}$ IF a_n is negative use $(-1)^n$		

$$a_n = (-1)^{n-1} \frac{n+2}{5^n}$$

Questions:

Notes: ARITHMETIC SEQUENCES

An arithmetic sequence, or arithmetic progression, is a sequence in which the terms increase or decrease by a common difference, d .

Ex] $8, 11, 14, 17, \dots$ $u_1 = 8$ and $d = 3$

Ex] $c, 2c, 3c, 4c, \dots$ $u_1 = c$ and $d = c$

FOR ANY ARITHMETIC SEQUENCE
 $u_{n+1} = u_n + d$ and the GENERAL

FORMULA FOR THE n th TERM IS

$$u_n = u_1 + (n-1)d$$

Ex] In an arithmetic sequence
 $u_9 = 48$ and $u_{17} = 75$. Find the
first term and common difference.

$$u_1 =$$
$$d =$$

$$u_9 + 3d = u_{17}$$

$$48 + 3d = 75$$

$$3d = 27$$

$$d = 9$$

HW 6B p. 166
6C p. 167

$$u_9 = u_1 + (9-1)d$$
$$48 = u_1 + (8)9$$

$$48 = u_1 + 72$$

$$-24 = u_1$$