Name _____ Class _____ Date _____ "_____"

Sequences

Explicit and Recursive Formulas

Answer Problem 1 from page 236 of your textbook. It is introduced below.

Rico owns a sporting goods store. He has agreed to donate $125 to the Centipede Valley High School baseball team for their equipment fund. In addition, he will donate $18 for every home run the Centipedes hit during the season. The sequence shown represents the possible dollar amounts that Rico could donate for the season.

125, 143, 161, 179, . . .

ARITHMETIC SEQUENCE

General Rule	Example
A lowercase letter is used to name a sequence.	a
The first term, or initial term, is referred to as a_1.	$a_1 = 125$
The remaining terms are named according to the term number.	$a_2 = 143$
A general term of the sequence is referred to as a_n, also known as the nth term, where n represents the *index*.	a_n
The term previous to a_n is referred to as a_{n-1}.	a_{n-1}
The common difference is represented as d.	$d = 18$

What's the index?

2

What is an EXPLICIT FORMULA?

A formula for calculating the value of each term using the term's index

any term

difference

$$a_n = a_1 + d(n-1)$$

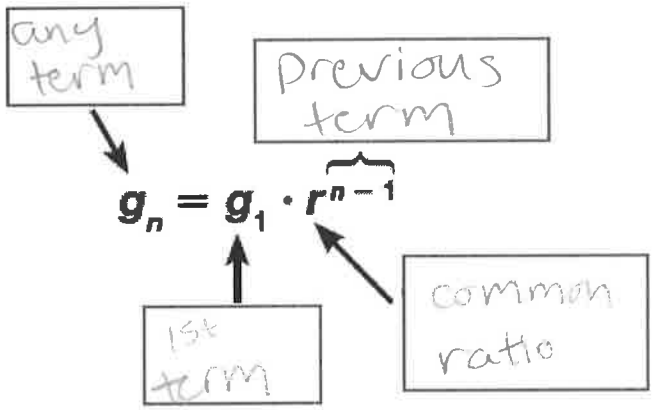
1st term

previous number

$a_n = 125 + 18(n-1)$

1, 1/2, 1/4, 1/8, 1/16, 1/32...

General Rule (GEOMETRIC SEQUENCE)	Example
A lowercase letter is used to name a sequence.	g
The first term, or initial term, is referred to as g_1.	$g_1 = 1$
The remaining terms are named according to the term number.	$g_3 = 1/4$
A general term of the sequence is referred to as g_n, also known as the nth term.	g_n
The term previous to g_n is referred to as g_{n-1}.	g_{n-1}
The common ratio is represented as r.	$r = 1/2$



$g_n = 1(1/2)^{n-1}$

What is a RECURSIVE FORMULA?

A formula that generates a new term based off of the term before it.

arithmetic SEQUENCE

general term

difference

$a_n = a_{n-1} + d$

previous term

geometric SEQUENCE

general term

ratio

$g_n = g_{n-1} \cdot r$

previous term