JANUARY 5

SWBAT:

use equations to define sequences

Sequence

list of numbers in an explicit order

$\{a_n\} = \{a_1, a_2, a_3, \ldots, a_n\}$

Explicity Defined Sequence

Defined in terms of n

$a_n = \frac{n-1}{n}$ $a_1 = 0, a_2 = \frac{1}{2}$

Recursively Defined Sequence

Defined in terms of the previous term (or terms)

$a_n = a_{n-1} + a_{n-2}$ if $a_1 = 1$ $a_2 = 1$

$a_3 = a_2 + a_1 = 1 + 1 = 2$

$a_4 = 3$ $a_5 = 5$

Fibonacci Sequence

Alternating Sequence

sign of terms alternates

$(-1)^n$ $(-2)^n = (-1)^n(2)^n$

Arithmetic Sequence

Sequence with a common difference

the difference between two consecutive terms

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

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

Explicit: $a_n = d(n - 1) + b$

starting number

Geometric Sequence

Sequence with a common ratio

ratio between 2 consecutive terms

$r = \frac{a_n}{a_{n-1}}$

Recursive: $a_n = a_{n-1}(r)$

$a_1 = 5$

Explicit: $a_n = b(r^{n-1})$

$\{a_n\} = 15, 13, 11, 9, \ldots$

arithmetic

$d = -2$

$a_n = a_{n-1} - 2$, where $a_1 = 15$ Recursive

$a_n = -2(n-1) + 15$ Explicit

$\{a_n\} = 6, 12, 24, 48, \ldots$

geometric

$r = 2$

$a_n = a_{n-1}(2)$ where $a_1 = 6$ Recursive

$a_n = 6(2)^{n-1}$ Explicit

$27, -9, 3, -1, \ldots$

geometric

$r = -\frac{1}{3}$

$a_n = a_{n-1}\left(-\frac{1}{3}\right)$ where $a_1 = 27$

$a_n = 27\left(-\frac{1}{3}\right)^{n-1}$

$= 27(-1)^{n-1}\left(\frac{1}{3}\right)^{n-1}$

Assignment #1

Pg 546 #3-13, 15-25