3-2 Arithmetic Sequences

Objectives

I can identify an arithmetic sequence.

I can write an arithmetic sequence as an explicit and recursive equation

Vocabulary - Common Difference, Term, initial value, explicit, recursive, arithmetic

Vocabulary

Arithmetic: Sequence that ADDS OR SUBTRACT

Common Difference: What I add or subtract d = common difference

First term: $a_1 = f$ 1st term in sequence

Explicit Equation: $a_n = d(n-1) \pm f$

Recursive Equation:

$$a_n = a_{n-1} \pm d$$
$$a_1 = f$$

Notation

$a_{n:}$ Value @ any TERM #

n: TERM #

a_{n-1}: Previous TERM

a_{n+1}: Next TERM

a_{n-1}, a_n, a_{n+1}

11, 9, 7, 5, 3, ...

State the next 3 numbers: 1, -1, -3

Common Difference: $d = -2$

First Term: 11

Explicit Equation: $a_n = -2(n-1) + 11$

Recursive Equation: $a_n = a_{n-1} - 2$

$a_1 = 11$

-5, -3, -1, 1,....

State the next 3 numbers: 3, 5, 7

Common Difference: 2

First Term: -5

Explicit Equation: $a_n = 2(n-1) - 5$

Recursive Equation: $a_n = a_{n-1} + 2$

$a_1 = -5$

11, 8, 5, 2....

State the next 3 numbers: $-1, -4, -7$

Common Difference: -3

First Term: 11

Explicit Equation: $a_n = -3(n-1) + 11$

Recursive Equation:

$$a_n = a_{n-1} - 3$$
$$a_1 = 11$$

Write an explicit formula for the given recursive formula

$a_n = a_{n-1} + 5.1, \quad a_1 = 7.5$

$a_n = a_{n-1} + d \quad a_1 = f$

$d = 5.1$

$f = 7.5$

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

$a_n = 5.1(n-1) + 7.5$

Write a recursive formula for the given explicit formula

$a_n = 9 + (-3)(n-1)$

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

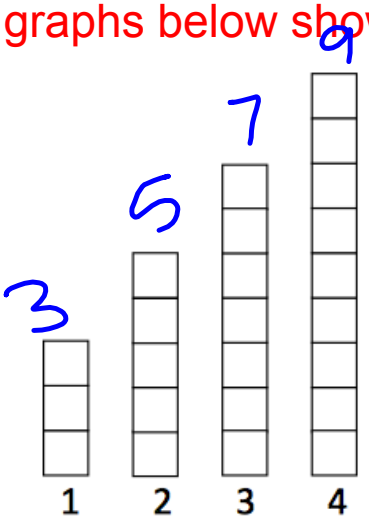
$f = 9$

$d = -3$

$a_n = a_{n-1} - 3$

$a_1 = 9$

Scott has decided to add push-ups to his daily exercise routine. The bar graphs below show his recorded push-ups each day.



11, 13, 15, 17, 19, 21

How many push-ups will he do on day 10?

$a_n = 2(n-1)+3$

$a_{10} = 2(10-1)+3 = 2(9)+3 = 18+3 = 21$

Write an explicit and recursive equation for the number of push-ups Scott does

R).