4 - 7
Arithmetic Sequence

sequence: set of numbers (terms) in a specific order

arithmetic sequence: the difference between successive terms is constant

Ex: 1, 3, 5, 7, ... yes
+2 +2 +2

Ex: $-\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}$ yes
$+\frac{1}{4}$ $+\frac{1}{4}$ $+\frac{1}{4}$

Ex: 1, 3, 6, 10, 15, ... no
+2 +3 +4 +5

Ex: Find the next 3 terms of
74, 67, 60, 53, ...

$-7 \quad -7 \quad -7$

46, 39, 32

What if you're asked to find
the 50th term?

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

$a_n = n^{th}$ term (50th, etc.)

$a_1 =$ the 1st term

$d =$ common difference

Ex: Find the 14th term of
9, 17, 25, 33, ...

$$a_{14} = 9 + (14 - 1)(8)$$

$$a_{14} = 9 + 13(8)$$

$$a_{14} = 9 + 104$$

$$a_{14} = 113$$

Ex: Find the 51st term of
7, 11, 15, 19, ...

$$a_{51} = 7 + (51-1)(4)$$

$$a_{51} = 7 + 50(4)$$

$$a_{51} = 7 + 200$$

$$a_{51} = \boxed{207}$$

Ex: Find the 17th term of
62, 65, 68, 71, ...

$$a_{17} = 62 + (17-1)(3)$$

$$a_{17} = 62 + 16(3)$$

$$a_{17} = 62 + 48$$

$$a_{17} = 110$$

Ex: Consider the sequence 12, 23, 34, 45, ...
Write an equation for the nth term
of the sequence.

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

$$a_n = 12 + (n-1)(11)$$

$$a_n = 12 + 11n - 11$$

$$a_n = 11n + 1$$

Homework:

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