Arithmetic Sequences
Find the missing numbers

x	1	2	3	4	5	6	7	8
y	6.3	14.5	22.7		39.1	47.3		63.7

+8.2 +8.2 ↑ 30.9 ↑ 55.5

Arithmetic Sequence : a sequence of numbers that have a common difference between the terms

EX: Is this an arithmetic sequence?

$\frac{1}{2}, \frac{1}{4}, 0, -\frac{1}{4}, -\frac{1}{2}$

$-\frac{1}{4}$ $-\frac{1}{4}$ $-\frac{1}{4}$ $-\frac{1}{4}$

EX: 1, 2, 4, 8

+1 +2 +4

If we know the common difference, we can find the next term in the sequence

EX: 74, 67, 60, 53, ___, ___, ___

↑ 46 ↑ 39 ↑ 32

EX: 9.5, 11, 12.5, ___, ___, ___

↑ 14 ↑ 15.5 ↑ 17

1	2	3	4
12	23	34	45

without going one by one, how can I find the 100th term?

First Term 12
Second Term $12 + 11$
Third Term $12 + 11(2)$
Fourth Term $12 + 11(3)$
Fifth Term $12 + 11(4)$

100th Term $12 + 11(99)$

The nth term a_n of an arithmetic sequence with a first term a_1 and a common difference d is:

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

EX: $3, -10, -23, -36$ Find the 15th term

$-13 \quad -13 \quad -13$

$d = -13 \quad a_1 = 3 \quad n = 15$

$$a_{15} = 3 + -13(15-1)$$
$$= 3 + (-13)(15) + 13$$
$$= 3 - 195 + 13$$
$$a_{15} = -179$$

EX: $23, 25, 27, 29$ Find the 12th term

$+2$

$d = 2 \quad a_1 = 23 \quad n = 12$

$a_{12} = 23 + 2(12-1)$
$23 + 2(11)$
$23 + 22$

$a_{12} = 55$