

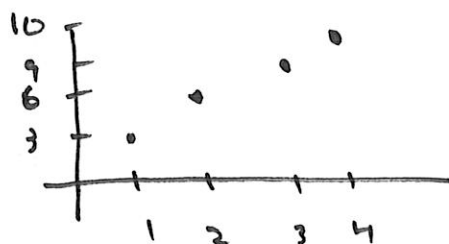
Sequences: A function that computes an ordered list.

x-value →
Domain

1 2 3 4
3, 6, 9, 12

finite sequence

y-value
Range



We don't use $f(x)$, sometimes use $f(n)$, that is to indicate the domain is natural numbers $1, 2, \dots$

Usually use a_n . Ex: a_{10} is the 10th term.

In the sequence above $a_3 = 9$

Ex 1 Write the first 5 terms of the sequence.

(a) $a_n = \frac{n+1}{n+2}$

n	a_n
1	$2/3$
2	$3/4$
3	$4/5$
4	$5/6$
5	$6/7$

Ex 1 (b) First 5 terms

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

n	
1	$(-1)^1 (1) = -1$
2	$(-1)^2 (2) = 2$
3	$(-1)^3 (3) = -3$
4	$(-1)^4 (4) = 4$
5	$(-1)^5 (5) = -5$

Recursive: ex: $a_1 = 4$, $a_n = 2 \cdot a_{n-1} + 1$, if $n > 1$

Explicit: ex: $a_n = (-1)^n n$

What is $a_{100} \rightarrow a_{100} = (-1)^{100} 100 = 100$

Recursive means repeating. Must know the previous term to find the following term.

Ex 2 $a_1 = 4$ $a_n = 2 \cdot a_{n-1} + 1$, if $n > 1$

n	a_n
1	4
2	$a_2 = 2 \cdot a_{2-1} + 1 = 2 \cdot a_1 + 1 = 2 \cdot 4 + 1 = 9$
3	$a_3 = 2 \cdot a_2 + 1 = 2 \cdot 9 + 1 = 19$

7.1

Day 1 (3)

Finite
Sequence 2, 4, 6, 8Series → sum of the terms of the sequence

$$2 + 4 + 6 + 8 = 20$$

 S_n → sum of the first n terms

Finite Series $S_n = a_1 + a_2 + \dots + a_n = \sum_{i=1}^n a_i$

↑
Sigma
"Sum"

Ex 4 Summation Notation

Evaluate $\sum_{k=1}^6 (2^k + 1)$

k	
1	$2^1 + 1 = 3$
2	$2^2 + 1 = 5$
3	$2^3 + 1 = 8 + 1 = 9$
4	$2^4 + 1 = 16 + 1 = 17$
5	$2^5 + 1 = 32 + 1 = 33$
6	$2^6 + 1 = 64 + 1 = 65$
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$$3 + 5 + 9 + 17 + 33 + 65 =$$

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