

Ch. 5 ~ Sequences

①

Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...

terms of seq

a_n
 b_n

notation: $F_1 = 1$
 $F_2 = 1$
 $F_3 = 2$
 $F_4 = 3$
 ...

indices
 index variable
 whole sequence $\{F_n\}_{n=1}^{\infty}$

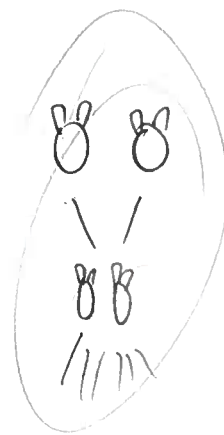
"index 3"

"seed"

Rule that generates Fib sequence:

"initial conditions"
 $F_1 = 1$
 $F_2 = 1$

$F_{n+1} = F_n + F_{n-1}$ ← "recurrence relation"



Fib sequence

"look & say sequence"



1 ← one 1
 11 ← two 1's
 21 ← one 2, one 1
 1211
 111221
 312211
 13112221
 1113213211
 ...

Limits of sequences

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We consider some examples:

a) $\{1+3n\}_{n=0}^{\infty}$

$1, 4, 7, 10, \dots \rightarrow \infty$
↑ ↑ ↑ ↑
n=0 n=1 n=2 n=3

b) $\{1-(\frac{1}{2})^n\}_{n=0}^{\infty}$

$0, \frac{1}{2}, \frac{3}{4}, \frac{7}{8}, \frac{15}{16}, \dots \rightarrow 1$

c) $\{(-1)^n\}_{n=0}^{\infty}$

oscillating
→ $1, -1, 1, -1, 1, -1, \dots$
Not conv

d) $\{\frac{(-1)^n}{n}\}_{n=1}^{\infty}$

$-1, \frac{1}{2}, -\frac{1}{3}, \frac{1}{4}, -\frac{1}{5}, \dots \rightarrow 0$