

# Fibonacci numbers

Let  $F_n = F_{n-1} + F_{n-2}$  for  $n > 1$  with  $F_0 = 0$  and  $F_1 = 1$ .

$n$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	...
$F_n$	0	1	1	2	3	5	8	13	21	34	55	89	144	233	...



Leonardo Fibonacci  
c. 1170 – c. 1250

Models many natural phenomena and is widely found in art and architecture.

## Examples.

- Model for reproducing rabbits.
- Nautilus shell.
- Mona Lisa.
- ...

## Facts (known for centuries).

- $F_n / F_{n-1} \rightarrow \Phi = 1.618...$  as  $n \rightarrow \infty$
- $F_n$  is the closest integer to  $\Phi^n / \sqrt{5}$

golden ratio  $F_n / F_{n-1}$

