

The Fibonacci sequence

- ➔ For the sequence: $1, 1, 2, 3, 5, 8, 13, 21, \dots$
- ➔ A recurrence relation defines f_n , the n th term in the sequence: $f_n = f_{n-1} + f_{n-2}$ for $n > 2$ (*)
- ➔ By letting $f_n \propto \lambda^n$ for some n , we can use (*) to get the equation $\lambda^2 - \lambda - 1 = 0$ (†)
- ➔ Solving the quadratic (†) gives solutions λ_1 and λ_2
- ➔ Let f_n be a linear combination of λ_1 and λ_2 , which means for some constants α, β : $f_n = \alpha\lambda_1 + \beta\lambda_2$
- ➔ Using $f_0 = 1, f_1 = 1$ to find α and β , we can derive an expression for f_n for any n .
- ➔ What is f_n ?