MATH0011: Mathematical Methods II

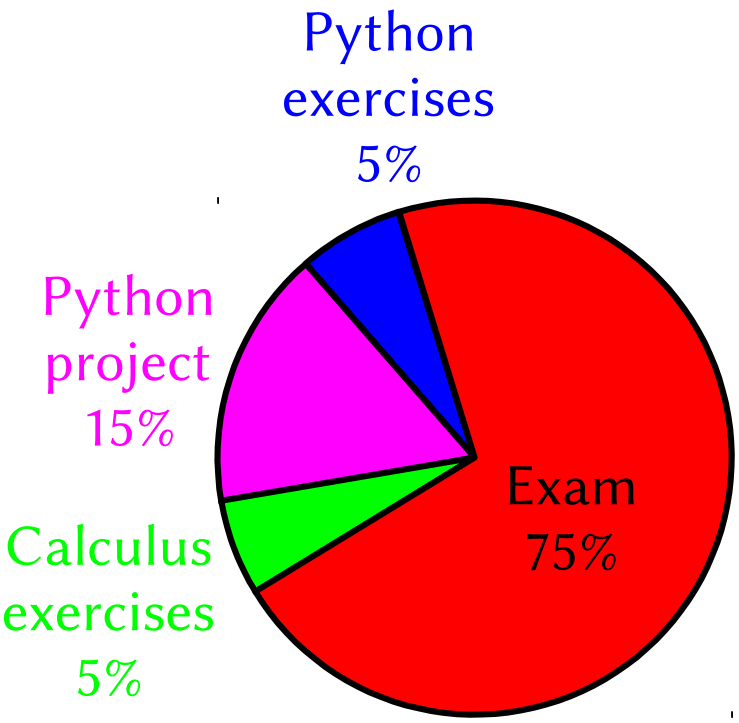
Part 1: Python Programming

Week 2: Types, lists & functions

- Two hour programming class
  - Tuesday 2:00–4:00, Birkbeck, 414/415
  - Tuesday 5:00–7:00, Torrington Place 1-19, 113
  - Wednesday 1:00–3:00, Christopher Ingold, G20
  - Wednesday 3:00–5:00, Christopher Ingold, G20
  - Thursday 9:00–11:00, Cruciform, B1.15A
  - Friday 9:00–11:00, Birkbeck 414/415

Mistake in first lecture:

- ~~10%~~ 5% Python exercises
- 15% Python project
- 5% Calculus exercises
- ~~70%~~ 75% Exam



It was proposed by Christian Goldbach that every odd composite number can be written as the sum of a prime and twice a square.

$9 = 7 + 2\times 1^2$

$15 = 7 + 2\times 2^2$

$21 = 3 + 2\times 3^2$

$25 = 7 + 2\times 3^2$

$27 = 19 + 2\times 2^2$

$33 = 31 + 2\times 1^2$

It turns out that the conjecture was false.

What is the smallest odd composite that cannot be written as the sum of a prime and twice a square?

A function is defined by:

$$f(x) = \begin{cases} \dfrac{x}{2} & x \text{ is even} \\ x + 1 & x \text{ is odd} \end{cases}$$

Picking a starting number and applying the function multiple times will eventually lead to the number 1.

How many times must the function be applied starting at 2019 to reach 1?