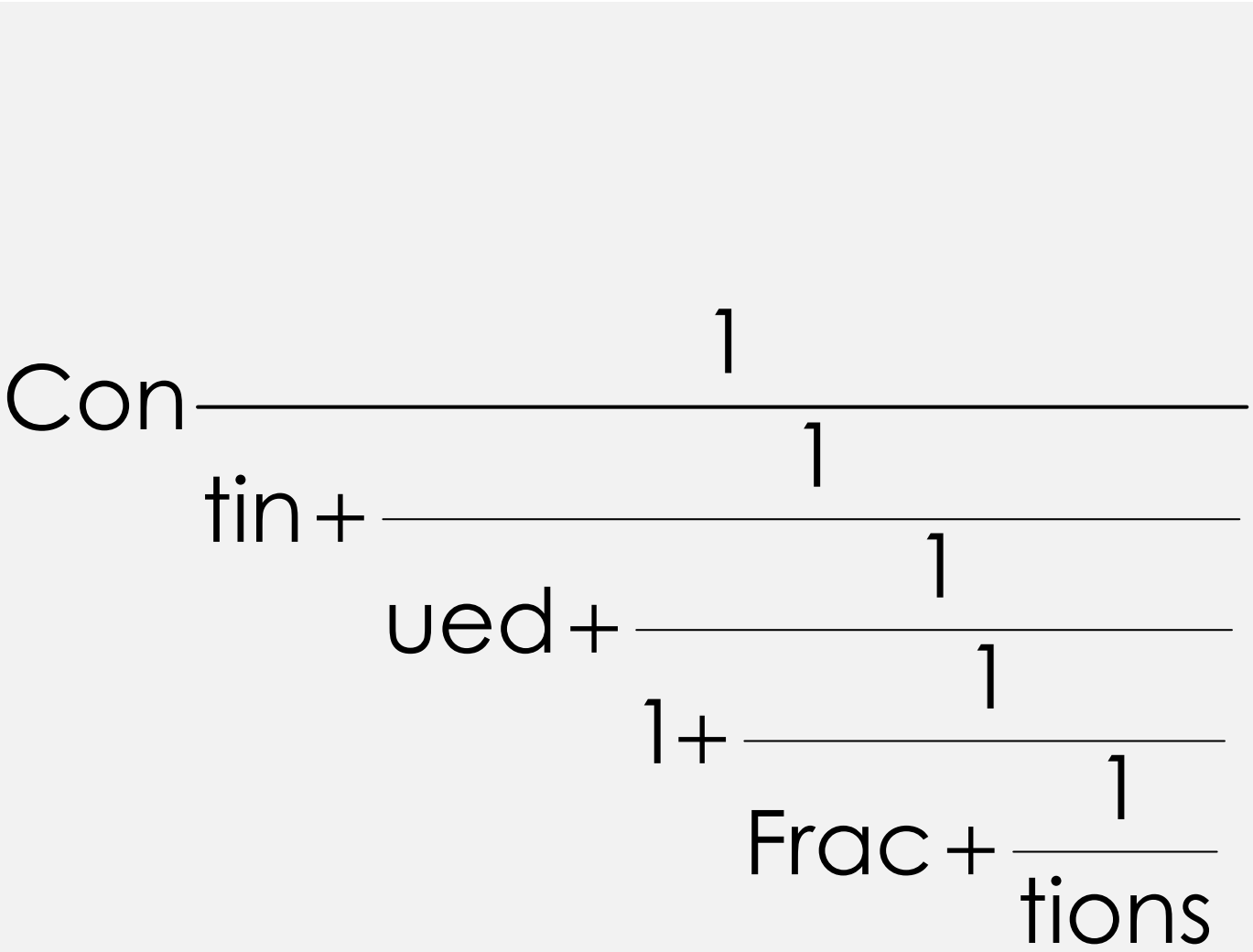


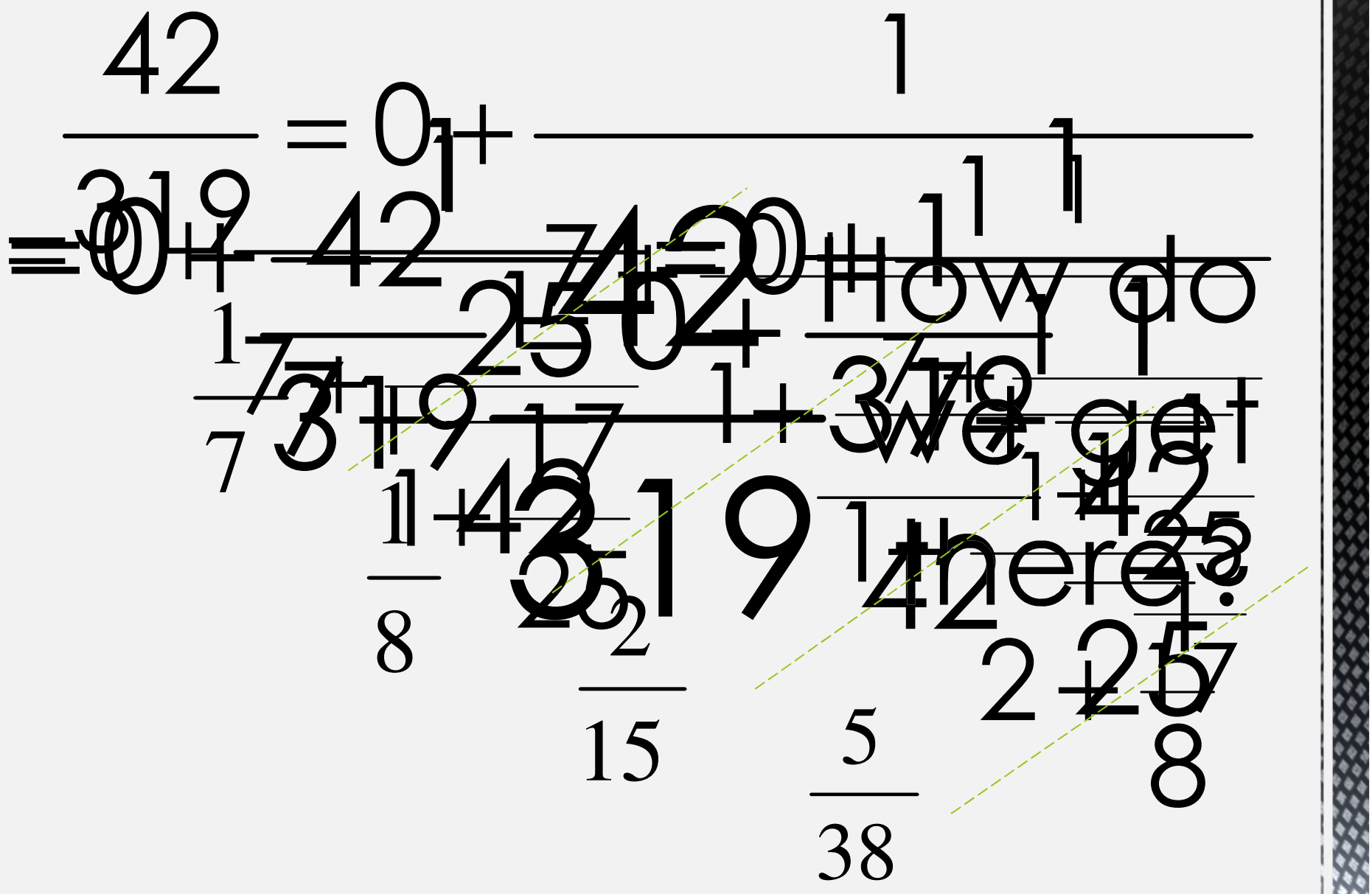
Project 4

Lead by:
Gleb Pogudin

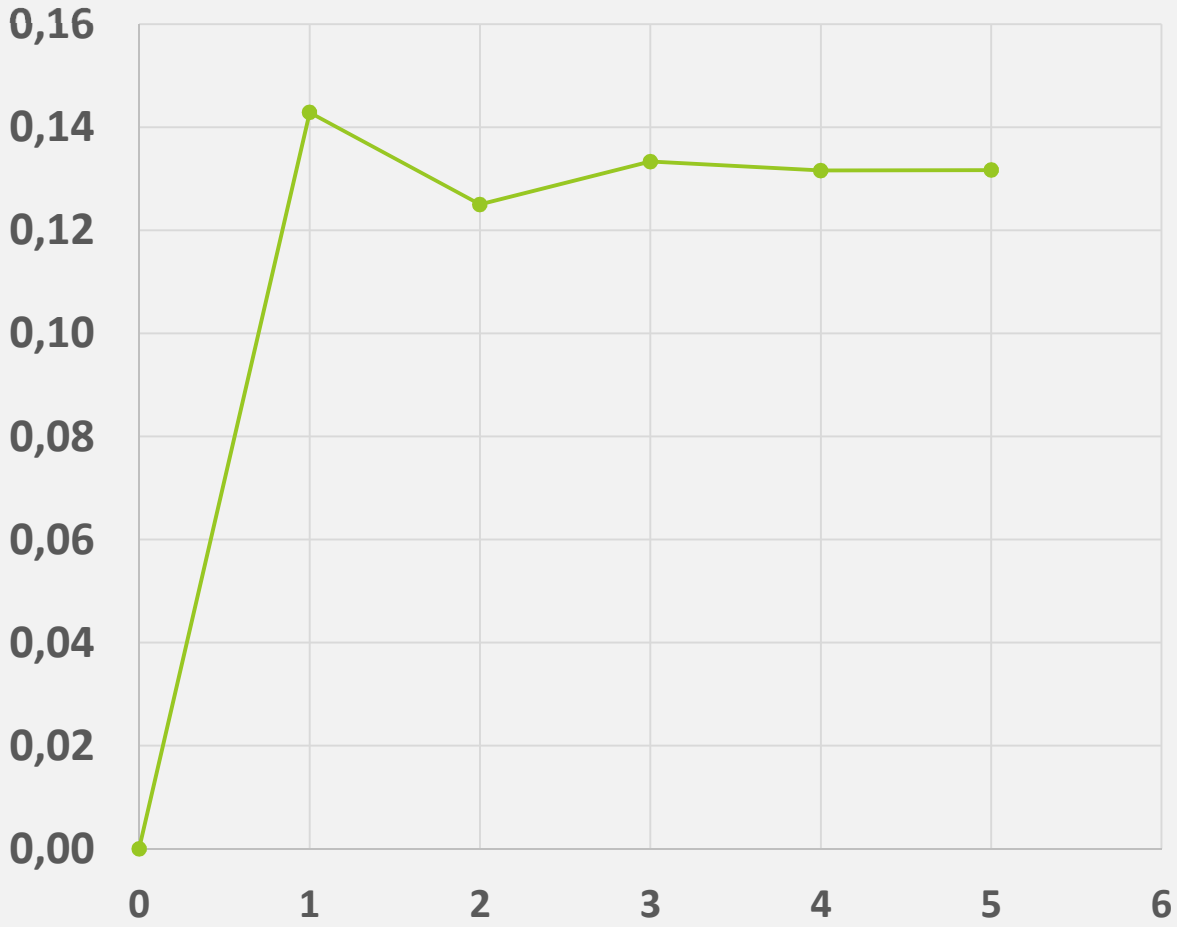
in English…

$$a = 2 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{4}}}}}$$

What is a continued fraction?


How do we get there?

Approximation of rational numbers



$$0 = 0$$

$$\frac{1}{7} = 0,14285\ldots$$

$$\frac{1}{8} = 0,125$$

$$\frac{2}{15} = 0,13333\ldots$$

$$\frac{5}{38} = 0,13157\ldots$$

$$\frac{42}{319} = 0,13166\ldots$$

*(**Best** approximation with the **smallest denominator**)*

Approximation of irrational numbers

π

$$\pi = 3 + \cfrac{1}{7 + \cfrac{1}{15 + \cfrac{1}{1 + \cfrac{1}{292 + \cfrac{1}{1 + \ldots}}}}} = 3.1415926\ldots$$

$$\frac{355}{113} = 3 + \cfrac{1}{7 + \cfrac{1}{15 + \cfrac{1}{1}}} = 3.1415929\ldots$$

Where can we use continued fractions?

- *Approximation of **numbers***
- *Integer solutions of equations*
- *Electric schemes*

<u>How to:</u>

- *Compare knots*
- *Improve the **calendar***
- *{exactly} approximate your **age***

What we actually did…

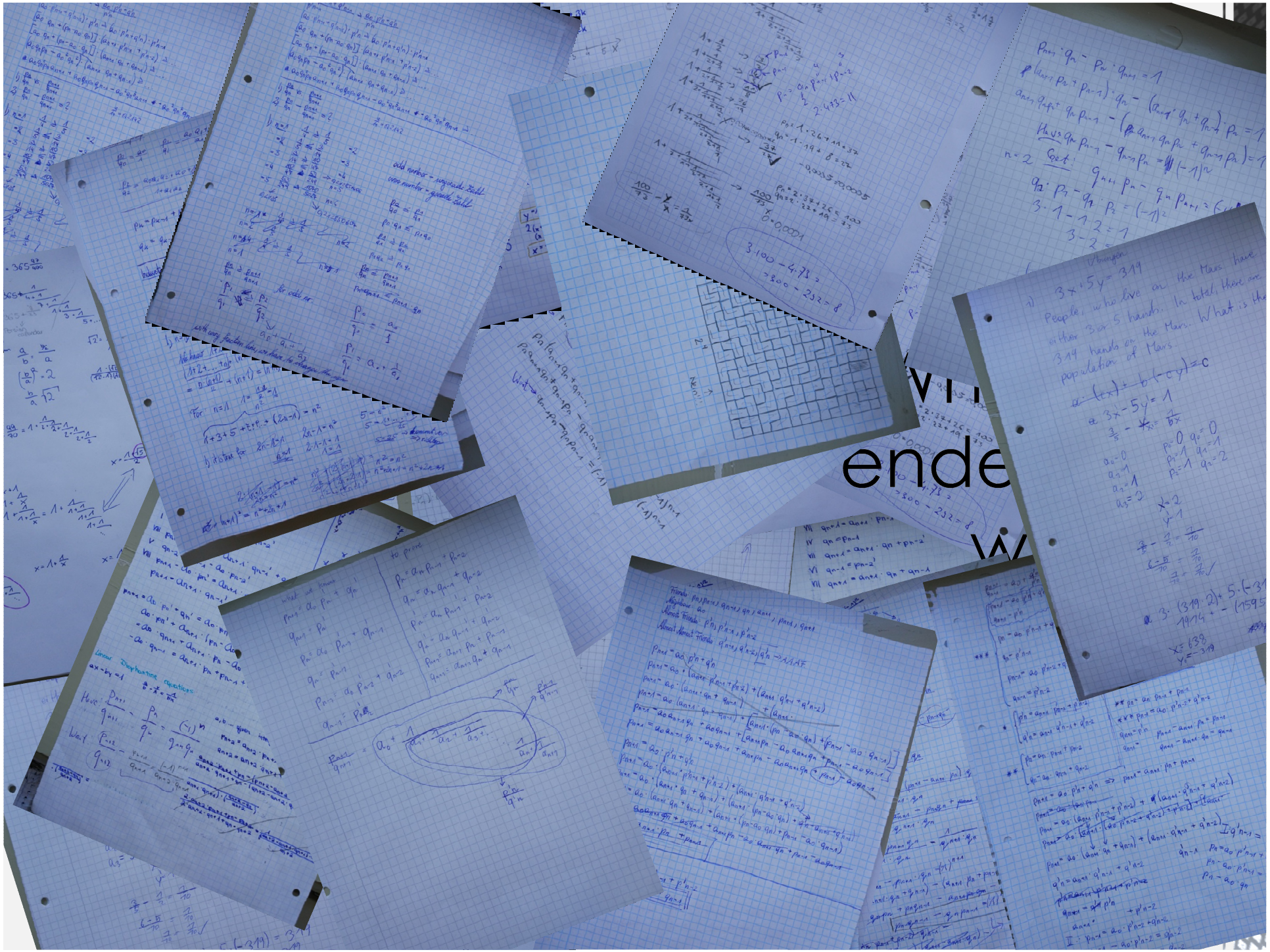
- Solved the following problems:
  - „*In how many ways can we spend **10.000€** on **bikes**?*“
  - „*How many people with three or five hands live on **Mars**?*“
- Nose-Stretching Algorithm
- Induction

- Dealing with operators **+ & –**
- *Handwriting* issues
- Struggling with PowerPoint…

Some new vocabulary...

What are …

- Numerator
- Denominator *{De**terminator**, **Demon**inator, Denumerator}*
- Integer *{Intiger}*
- Remainder


ende

to be continued…

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