What is Mathematics?

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Introduction

I sit with my coffee and wonder, can I explain the general pattern of Mathematics on a single page?

My gut says yes, my brain says maybe, and so I shall give it a go.

Mathematics, the written language

I aim to explain the essential concepts of the Mathematics humans write on rectangular surfaces.

My claims are limited to that scope, though you may find these concepts useful beyond this.

Cheating, a bit

I need to admit that although this essay shall not exceed a page (including illustrations), I am undercounting the length of my explanation of Mathematics because I am ignoring the considerable requirements the reader must have developed to be able to parse English.

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Ok. No more caveats. Time for the essential concepts in Mathematics.
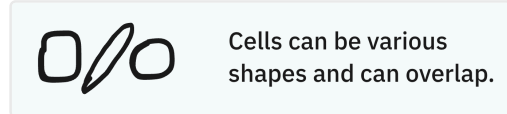
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Pixel Surface

Mathematics requires a 2D contiguous grid of Pixels whose color can be altered.

A zoomed in surface showing Pixels.

Cells

Mathematics requires the ability to draw or envision membranes around contiguous groups of pixels to form Cells.

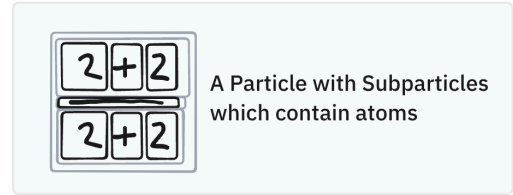Cells can be various shapes and can overlap.

Atoms

Mathematics requires Atoms, which are single indivisible cells with colored pixels.

3 Atoms

Particles

Mathematics requires Particles, which are contiguous regions that can contain atoms and other particles recursively (called subparticles).


A Particle with Subparticles which contain atoms

Holes

Holes are Particles that contain an identification atom and a list of atoms that fit that hole.

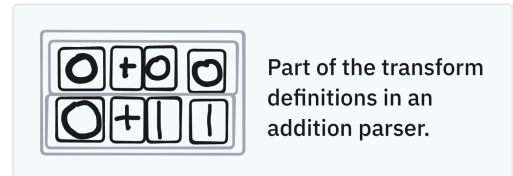Holes are particles that define sets of atoms.

Parsers

Parsers are a type of particle who's atoms and subparticles define holes. Parsers are pressed against other particles and bind to particles who's subparticles and atoms fit a parser's holes.
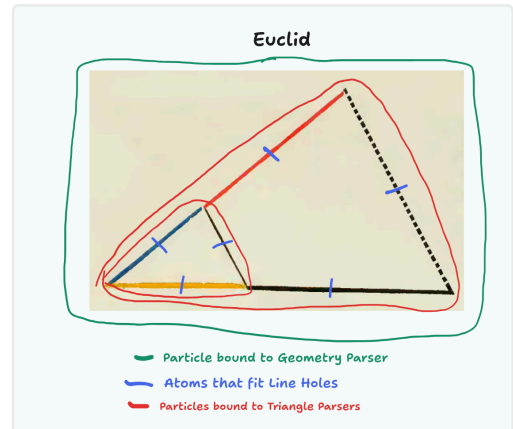

Part of a simple addition parser
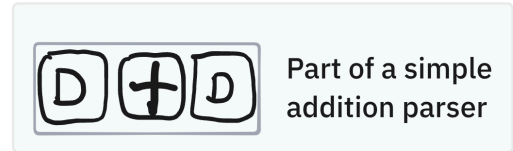
Transforms

Parsers can contain Transform definitions, which are Mathematics that transform one particle into another.

Part of the transform definitions in an addition parser.

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These meta concepts are enough to define all of Mathematics.

Euclid

Particle bound to Geometry Parser
Atoms that fit Line Holes
Particles bound to Triangle Parsers

These concepts apply not just to formulae, but to geometry, et al as well.

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