

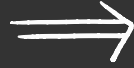
Abstractions in Mathematics.

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What is the nature of abstraction?

Abstraction level n



Abstraction Level $n+1$

Family of structures

Object A

Object B

Object C

...

Abstraction

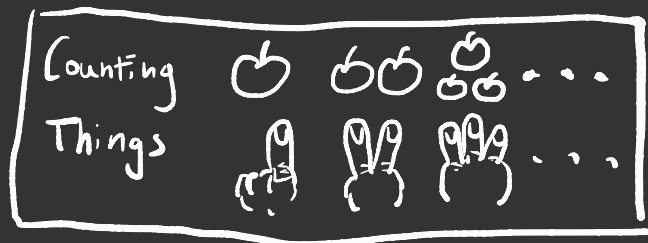


New Concept

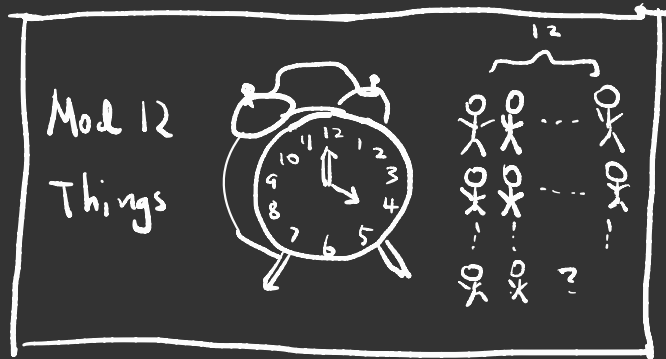
Abstraction level 0



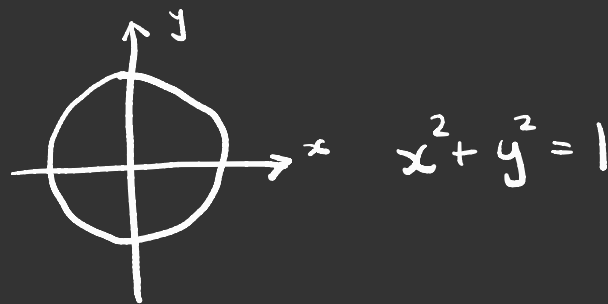
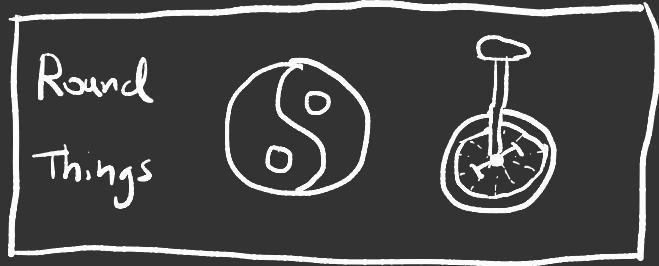
Abstraction level 1



1, 2, 3, ...



0 mod 12, 1 mod 12, ..., 11 mod 12



Abstraction Level 1



Abstraction Level 2

Number Systems

$\mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}, \mathbb{Z}[F]$



Rings

Symmetries



$\text{Gal}(f)$



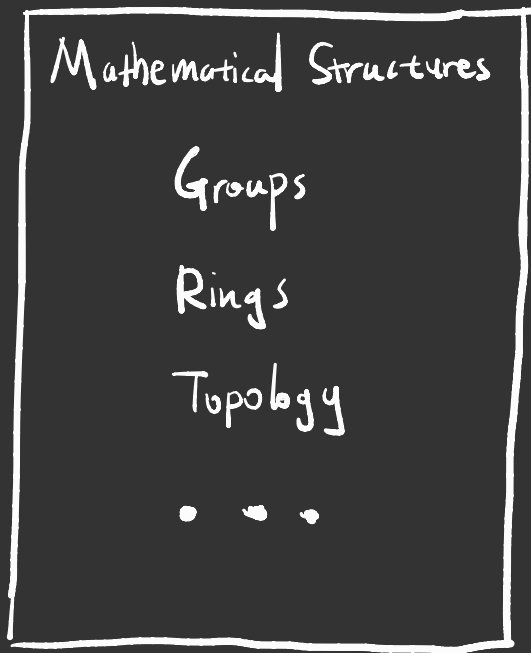
Groups

Shapes



Topology

Abstraction Level 2 \Rightarrow Abstraction Level 3



\Rightarrow Category

Abstraction Level 3 \Rightarrow Abstraction Level 4



2-Category of categories
CAT