



Three for One

Intro to Homotopy Type Theory, No. 1



Three for
One

The background features three overlapping, wavy-edged shapes: a green one on the left with mathematical symbols like Σ , Δ , and \times ; a brown one in the middle with symbols like Δ , \rightarrow , and \leftarrow ; and a purple one on the right with symbols like $*$, \sim , and π . Below these shapes is a solid dark red rectangular area.

A riddle...

1

Three for One

Intro to HoTT, No. 1

Solution: Ice!

Ice

Steam

H₂O

Liquid
Water

Ice



Steam

Previously on Intro to HoTT...

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Three for One

Intro to HoTT, No. 1

- Theorems are types? Proofs are terms?
- What's homotopy theory? What's its connection to homotopy *type* theory?

Computational Trinitarianism

Three understandings of what HoTT “means”:

- Programming Interpretation
- Homotopy Interpretation
- Logic Interpretation



This video: 1

unit
is the
contractible
type

Programming

Logic

Homotopy

HoTT

0 Terms and Types

The Typing Judgment

$$t : T$$

“ t is a term of type T ”

Example: natural numbers

- \mathbb{N} is a type
- $0 : \mathbb{N}, 1 : \mathbb{N}, 2 : \mathbb{N}, 3 : \mathbb{N}, \dots$

- Terms
- Types
- Typing judgment (between terms and types)

Next Time

- Formalizing HoTT in Agda
- Judgments and Judgmental Equality

To be continued...

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