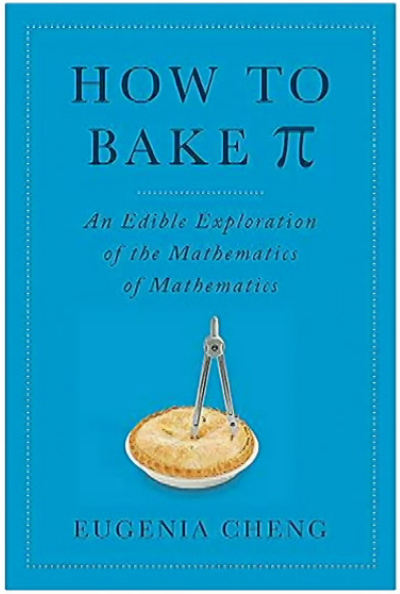
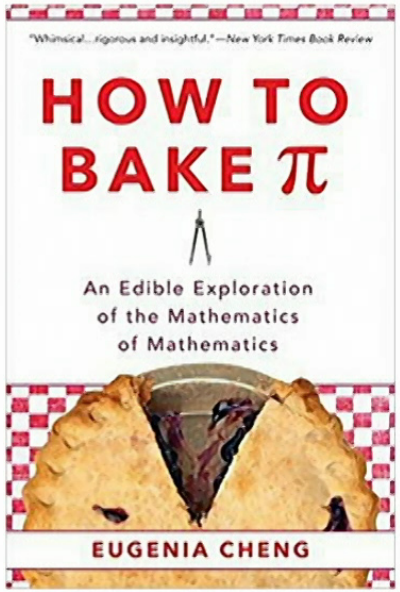
Title: Eugenia Cheng: How to Bake Pi

Date: Apr 05, 2017  07:00 PM

URL: http://pirsa.org/17040000

Abstract: Mathematics can be tasty! Itâ€™s a way of thinking, and not just about numbers. Through unexpectedly connected examples from music, juggling, and baking, Dr. Eugenia Cheng will demonstrate that math can be made fun and intriguing for all. Her interactive talk will feature hands-on activities, examples that everyone can relate to, and funny stories. She will present surprisingly high-level mathematics, including some advanced abstract algebra usually only seen by math majors and graduate students. There will be a distinct emphasis on edible examples.


HOW TO
BAKE π
An Edible Exploration
of the Mathematics
of Mathematics
EUGENIA CHENG


"Whimsical...rigorous and insightful."—New York Times Book Review
HOW TO
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1.

# Plan

1. Bach
2. Juggling
3. Hair

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1. Bach
2. Juggling
3. Hair
4. Factors of 30
5. Cake
6. Custard.

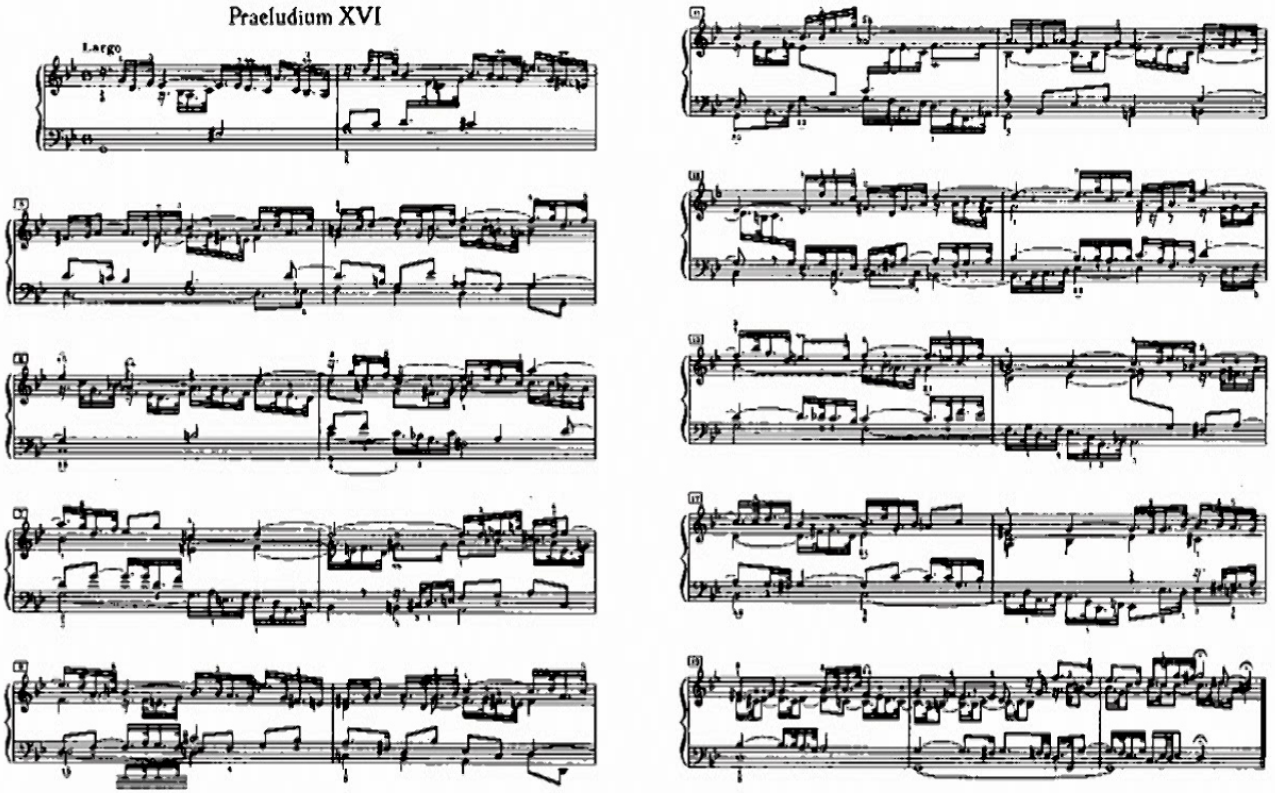
## What is Mathematics?

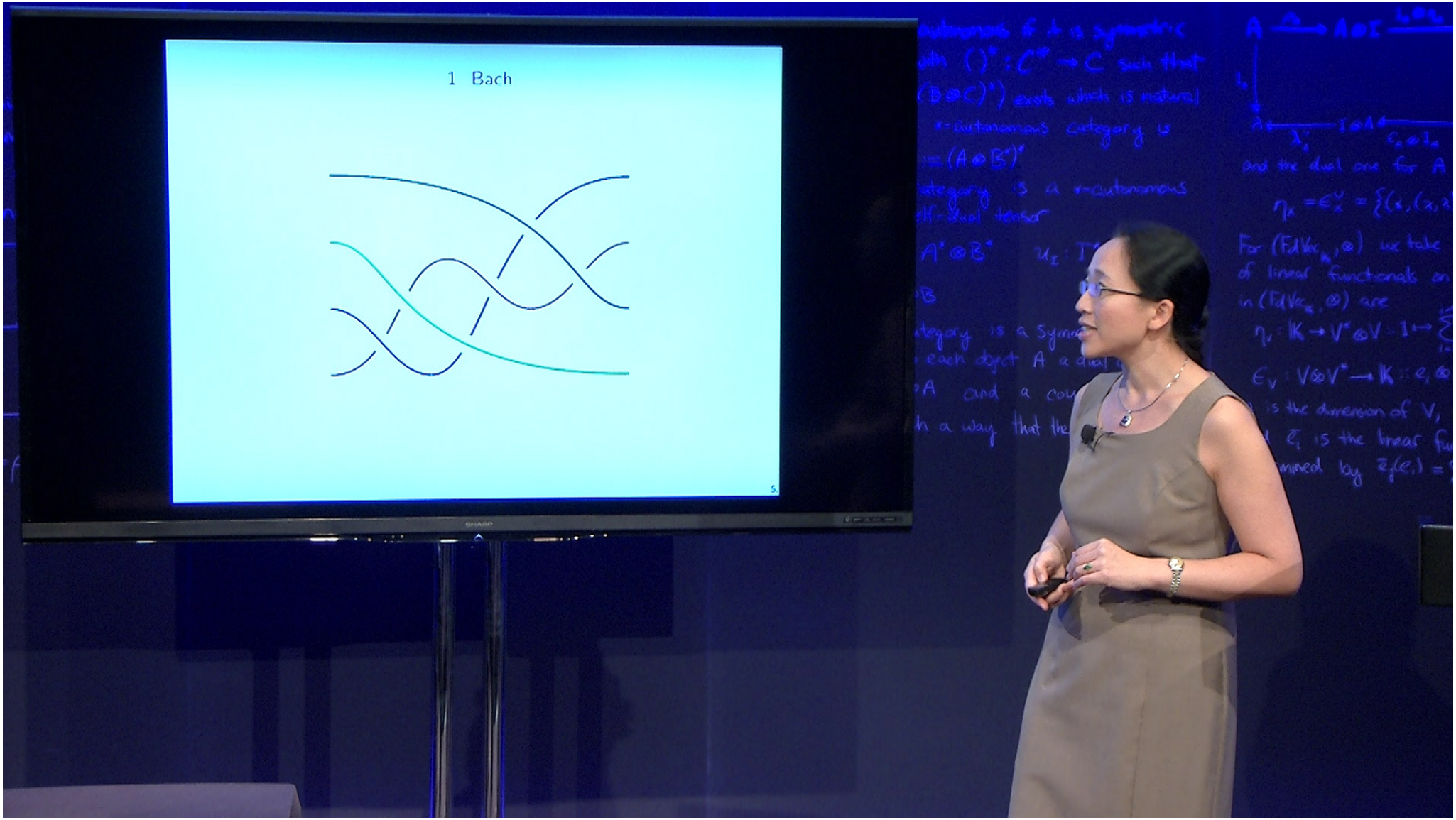
Mathematics is the logical study of how logical things work.

3.

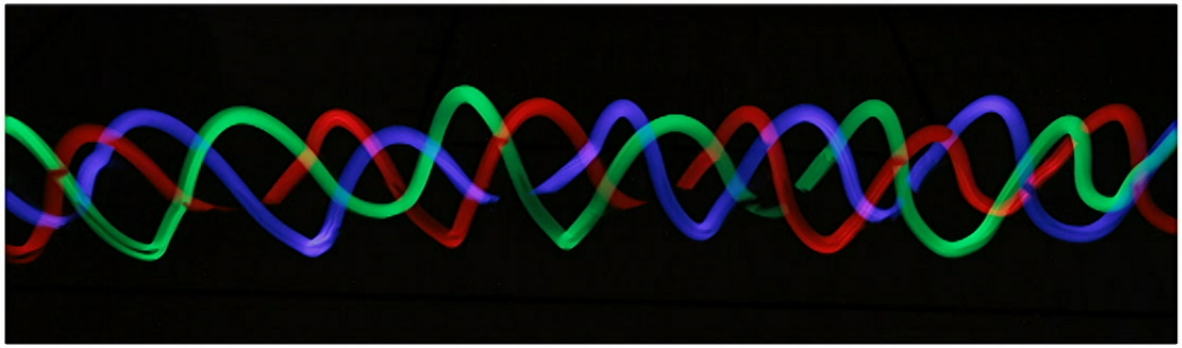
# 1. Bach

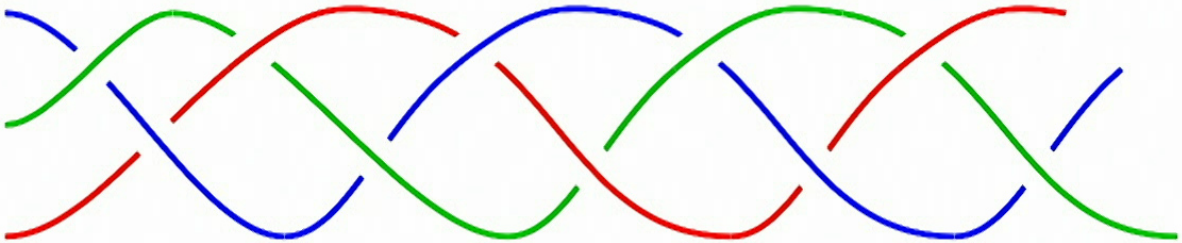
## Prelude in G minor: Book 2 of the Well-Tempered Clavier




1. Bach
5

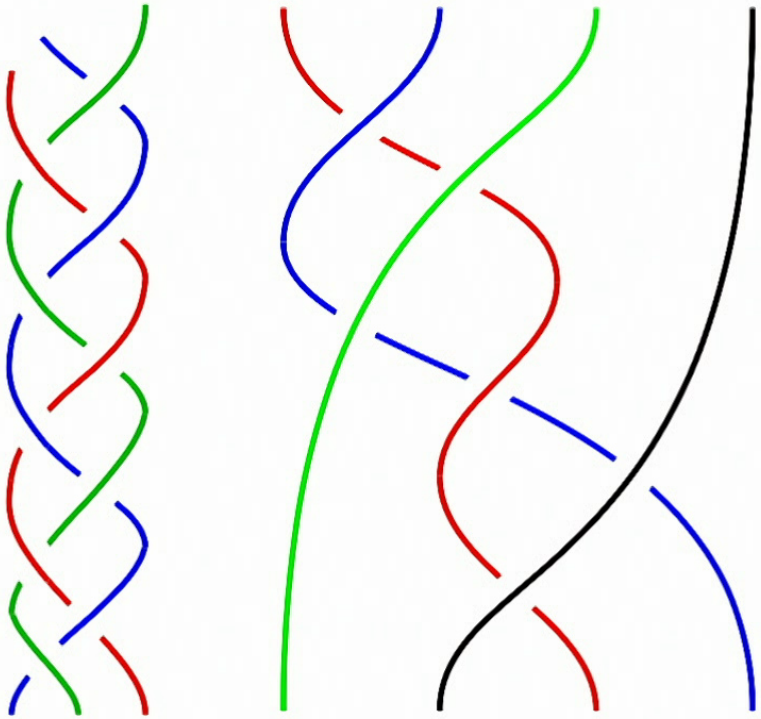
## 2. Juggling





6.

## 3. Hair



## 4. Factors of 30

1, 2, 3, 5, 6, 10, 15, 30

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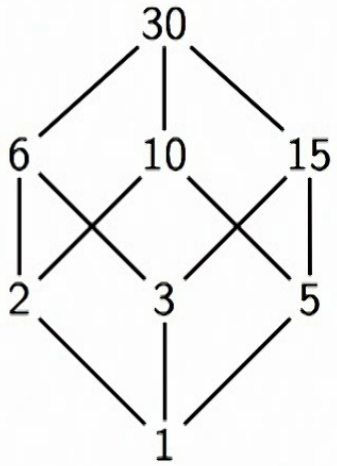
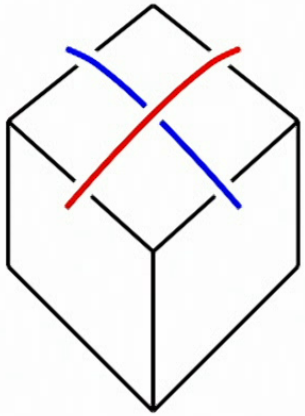
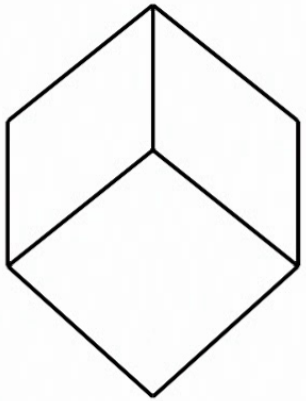
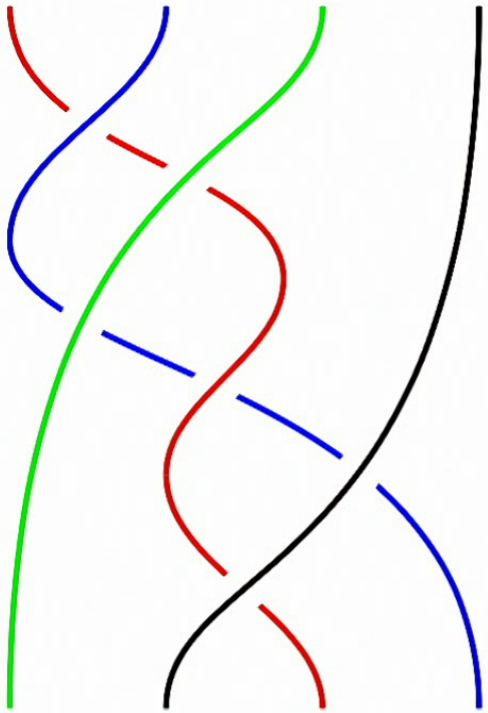
1, 2, 3, 5, 6, 10, 15, 30





# 4. Factors of 30



9.

## 5. Cake

### Battenberg cake

## 5. Cake

### Battenberg cake

| $\times$ | $1$ | $-1$ |
|---|---|---|
| $1$ | $1$ | $-1$ |
| $-1$ | $-1$ | $1$ |

| $+$ | even | odd |
|---|---|---|
| even | even | odd |
| odd | odd | even |

| $\times$ | real | imaginary |
|---|---|---|
| real | | |
| imaginary | | |

10.

## Bed flipping

| | 0 | rot | flip | flop |
|---|---|---|---|---|
| 0 | A | B | C | D |
| rot | | | | |
| flip | | | | |
| flop | | | | |

## 5. Cake

### Bed flipping

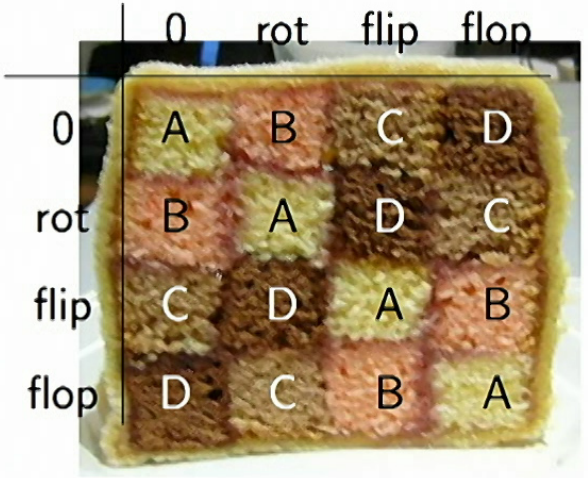
| | 0 | rot | flip | flop |
|---|---|---|---|---|
| 0 | A | B | C | D |
| rot | B | A | D | C |
| flip | C | D | A | B |
| flop | D | C | B | A |

## Bed flipping

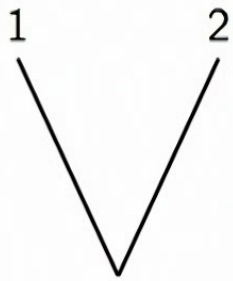
| | 0 | rot | flip | flop |
|---|---|---|---|---|
| 0 | A | B | C | D |
| rot | B | A | D | C |
| flip | C | D | A | B |
| flop | D | C | B | A |

## Bed flipping

| | 0 | rot | flip | flop |
|---|---|---|---|---|
| 0 | A | B | C | D |
| rot | B | A | D | C |
| flip | C | D | A | B |
| flop | D | C | B | A |



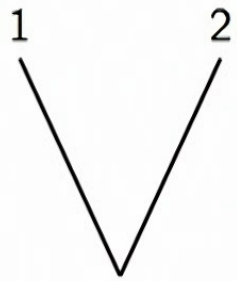
# 5. Cake



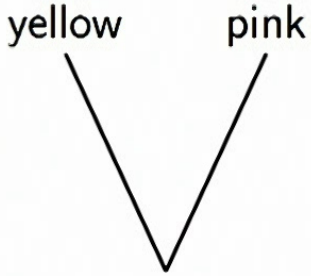

13.

## 5. Cake

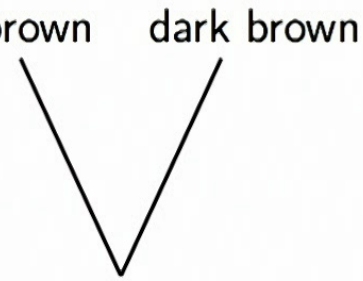
| cake 1 | cake 2 |
|---|---|
| bunny 1 | bunny 2 |
| light brown | dark brown |
| yellow | pink |




cake 1 =



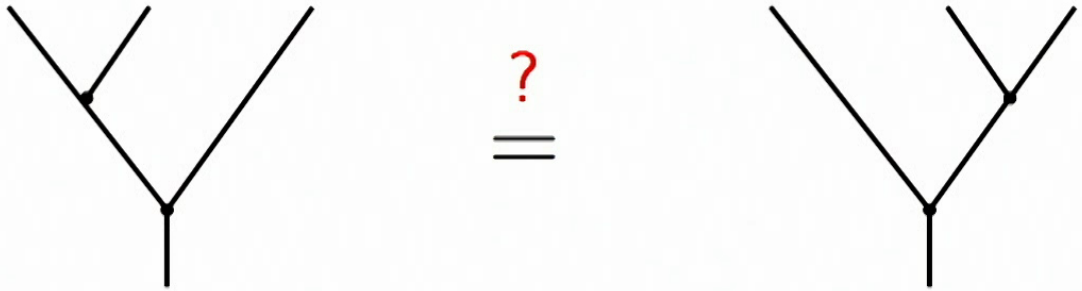

cake 2 =




13.

## 6. Custard

Trees come from sticking things together.



## 6. Custard

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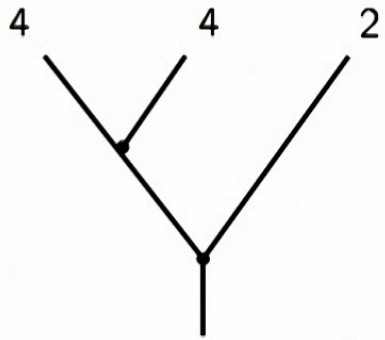
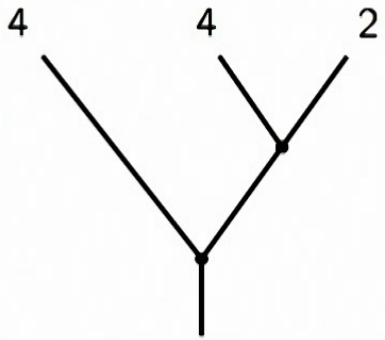



$(4 + 4) + 2 = 10$

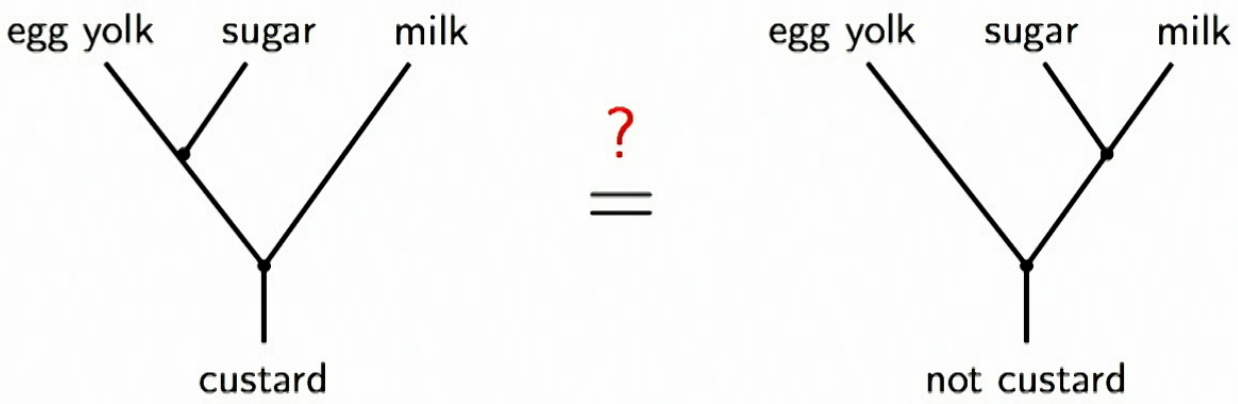
$=$




$4 + (4 + 2) = 10$

## 6. Custard

Trees come from sticking things together.



## What is Category Theory?

Mathematics is the logical study of how logical things work.

Category Theory is the Mathematics of Mathematics.

—the logical study of

the logical study of

how logical things work.