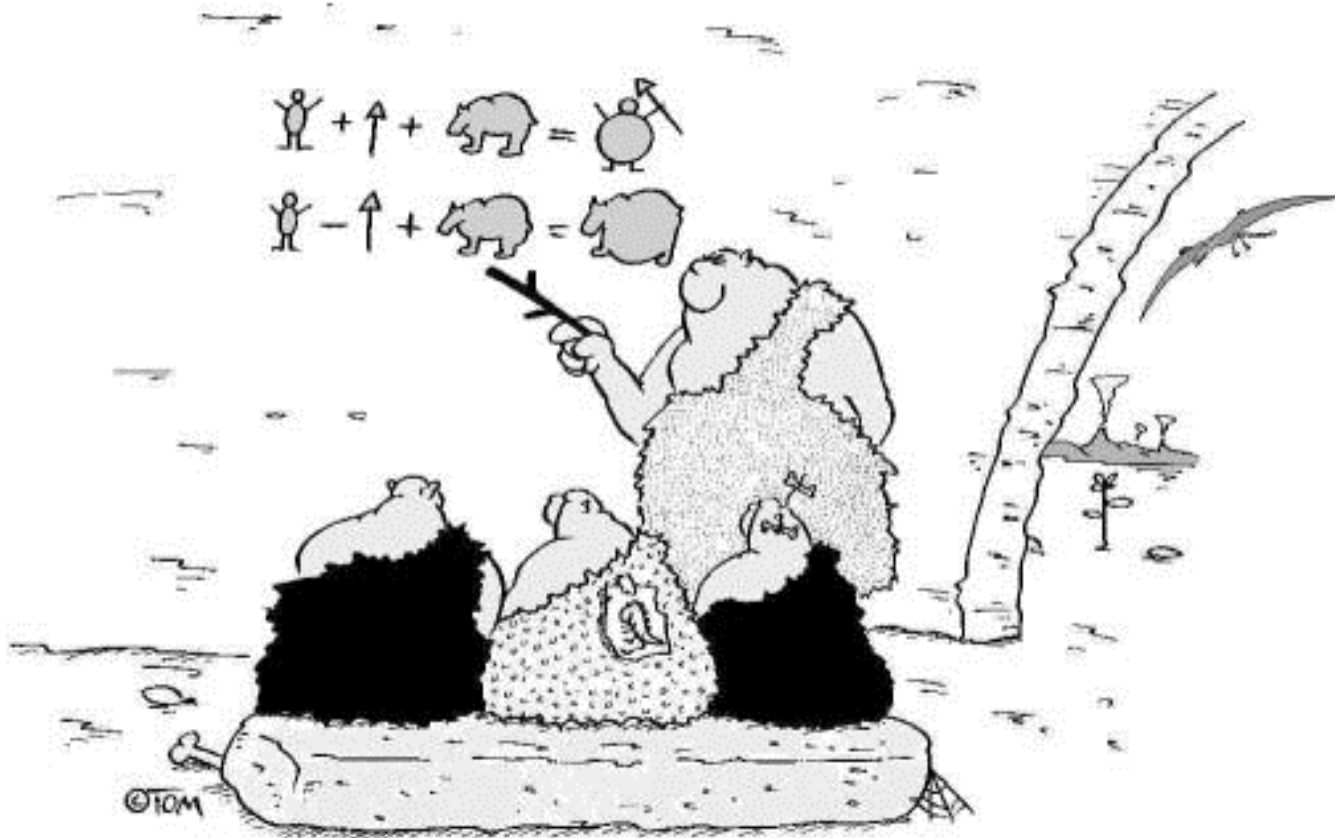


Welcome to Grade 9 Math!



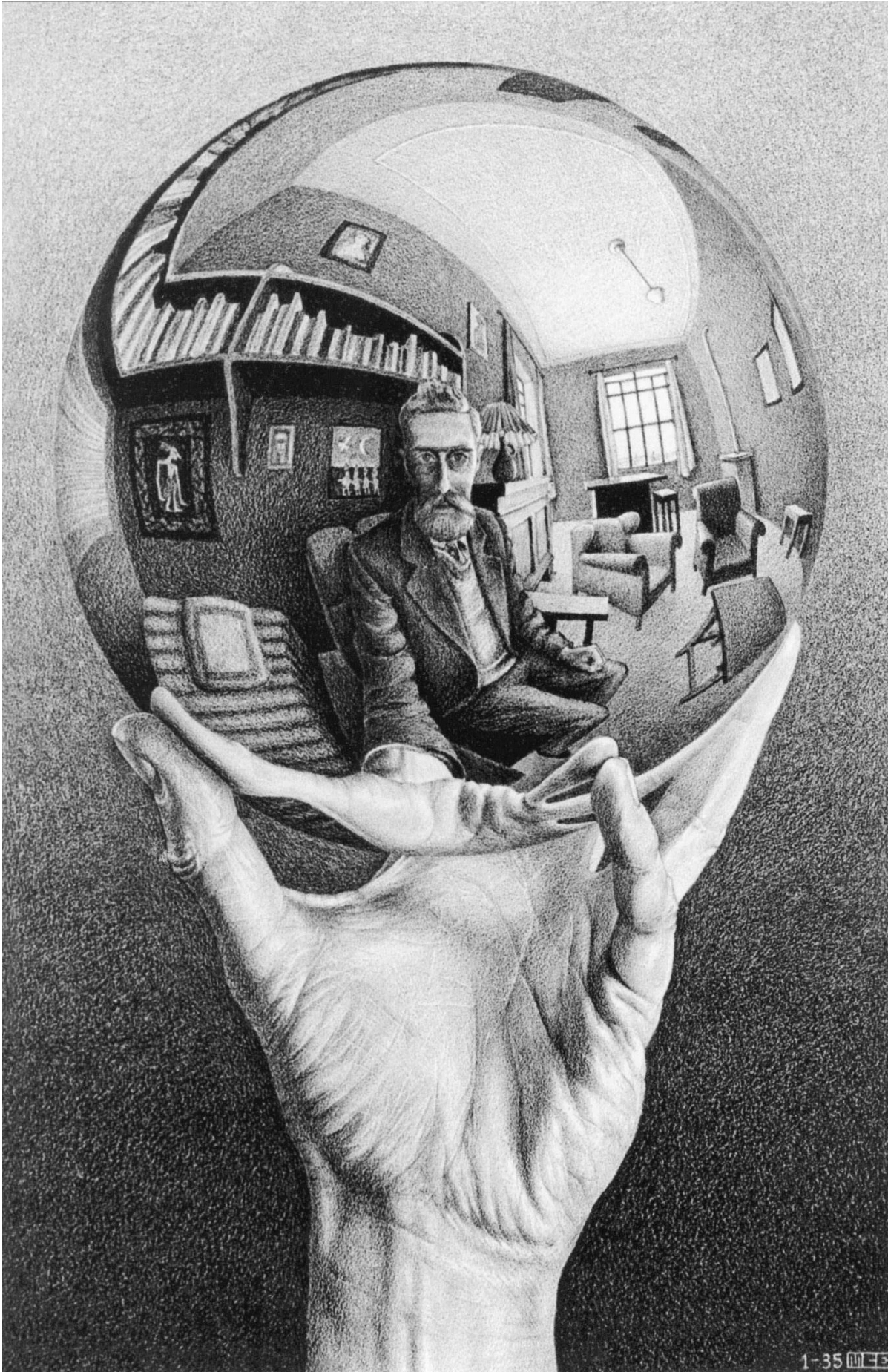
Why?! Why the heck are you forced to sit here and listen to me blabber on about rational-this or solve-that?

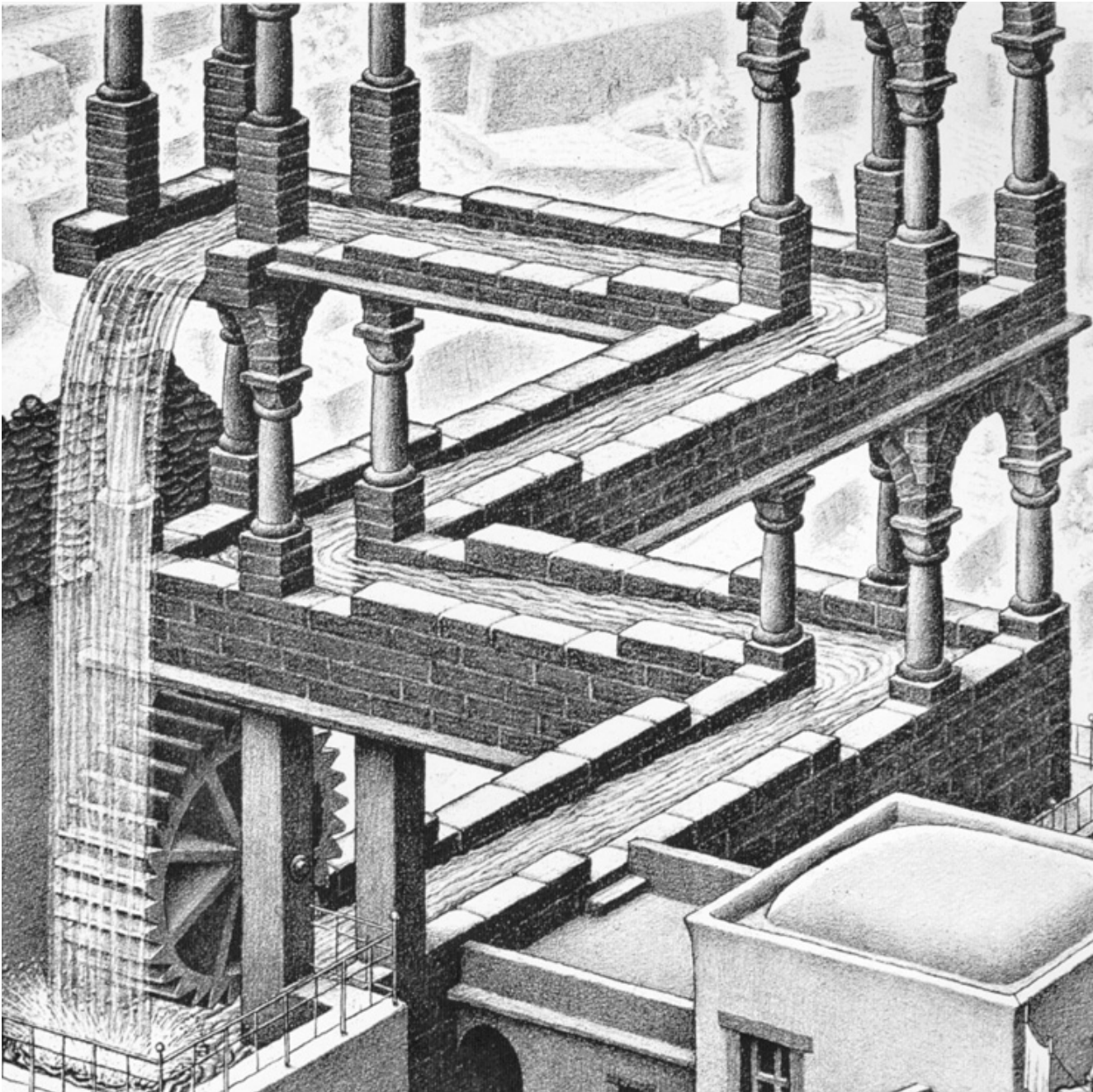
Why is mathematics education so important?

"The great book of nature can be read only by those who know the language in which it was written. And that language is mathematics. Math is the way to understand all sorts of things in the world around us." - Galileo Galilei

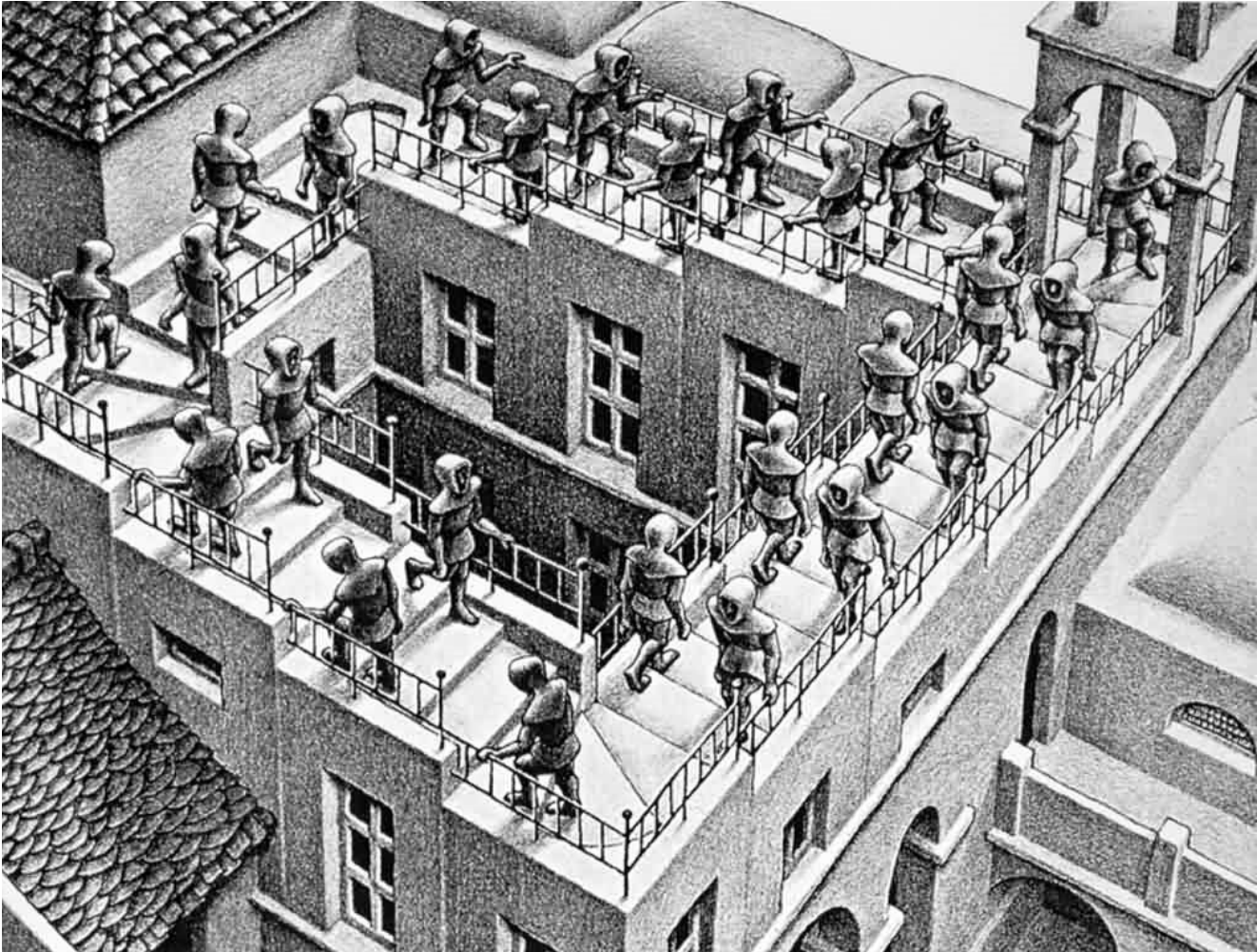
- **Math is a way of thinking.**
- **Math is problem solving skills.**
- **Math is art & nature.**
- **Math is powerful.**
- **Math is awesome.**
- **Math is not stupid.**
 - > **You may get frustrated,**
 - > **You may need extra help,**
 - > **You may not see the point,**
 - > **But math is still not stupid.**

Math in Art & Nature





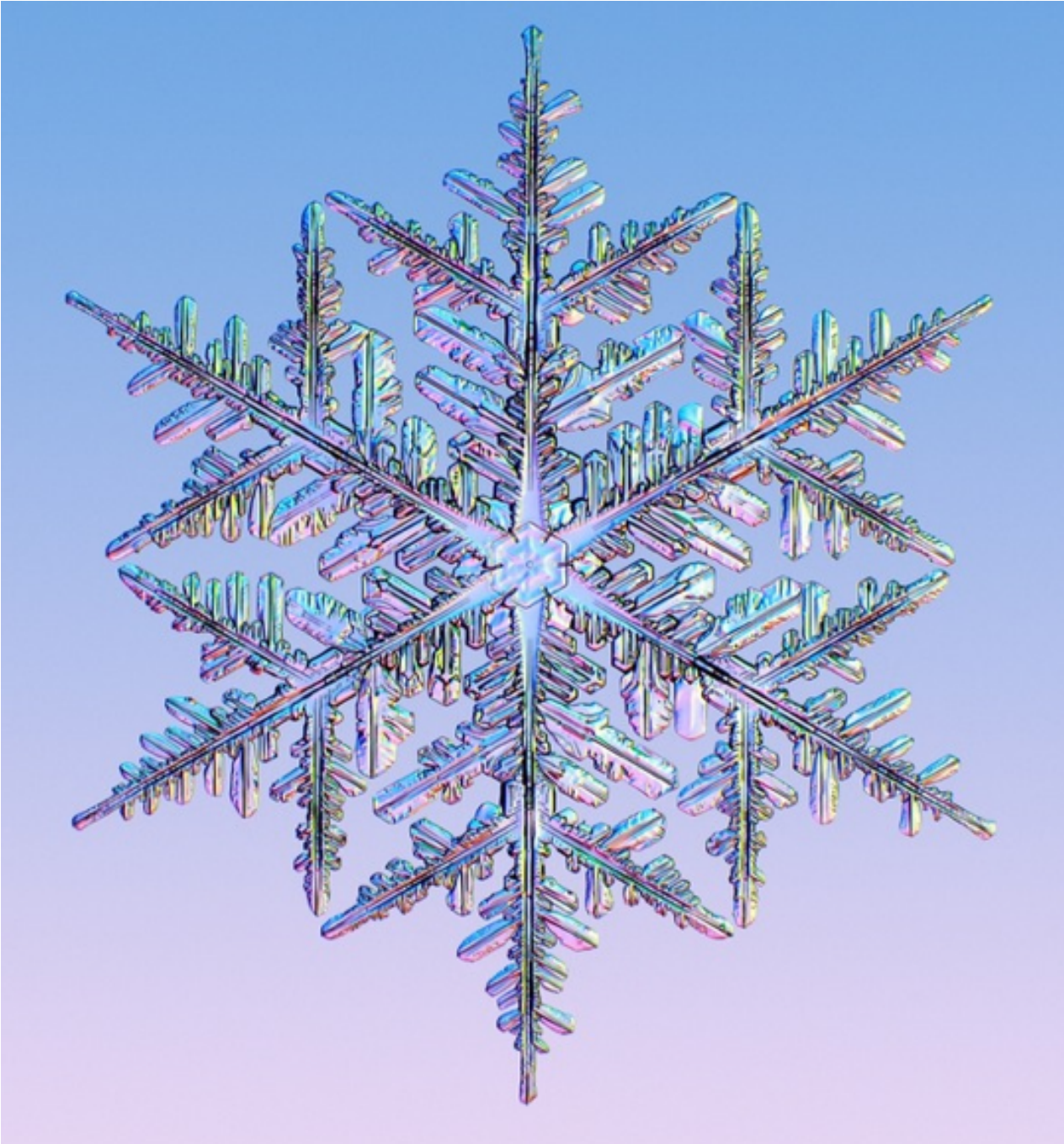
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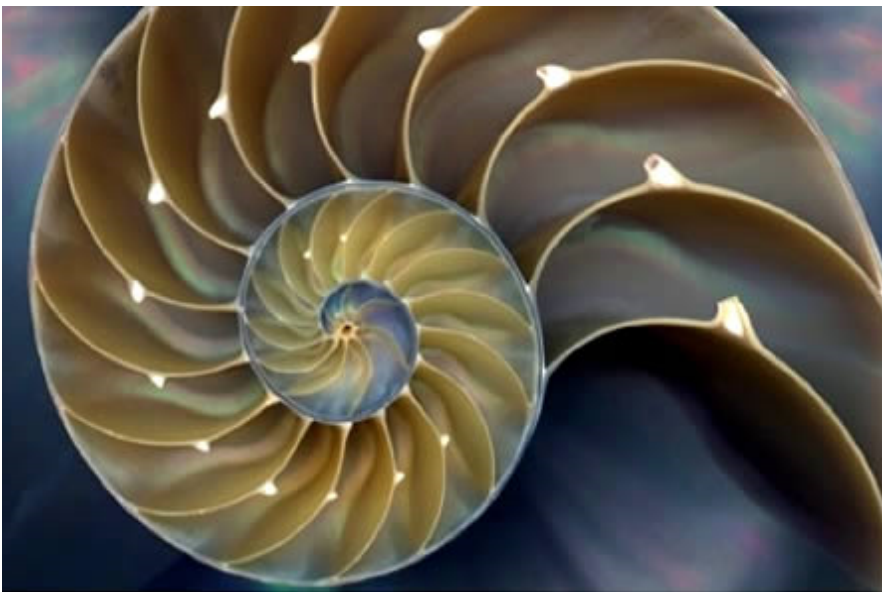
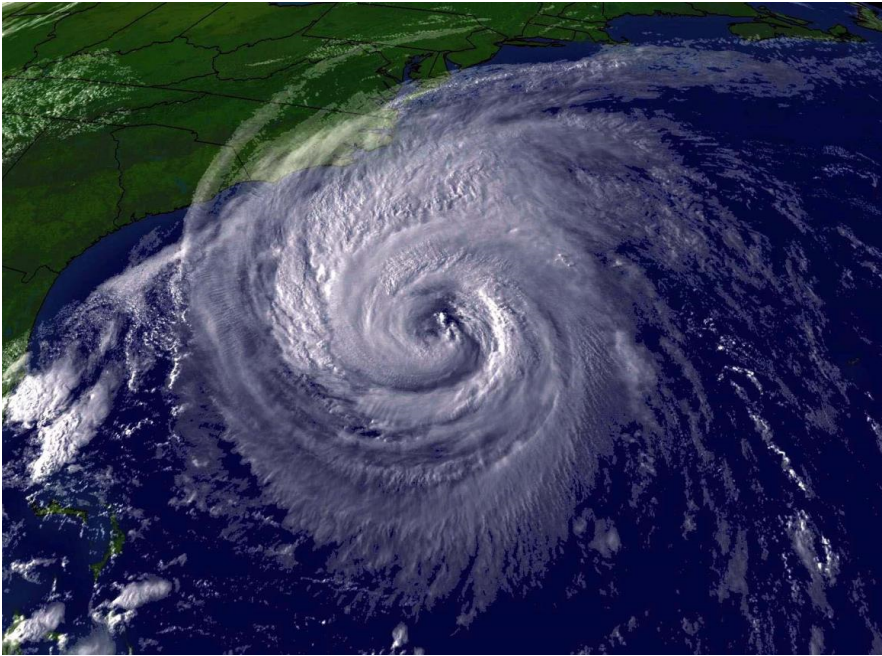












Without Math this shirt
would confuse you:



Without math...

$$\frac{x^2}{49} + \frac{y^2}{9} - 1 \leq 0 \text{ and } |x| \geq 4 \text{ and } -\frac{3\sqrt{33}}{7} \leq y \leq 0 \text{ or } |x| \geq 3 \text{ and } y \geq 0$$

or $-3 \leq y \leq 0$ and $-4 \leq x \leq 4$ and

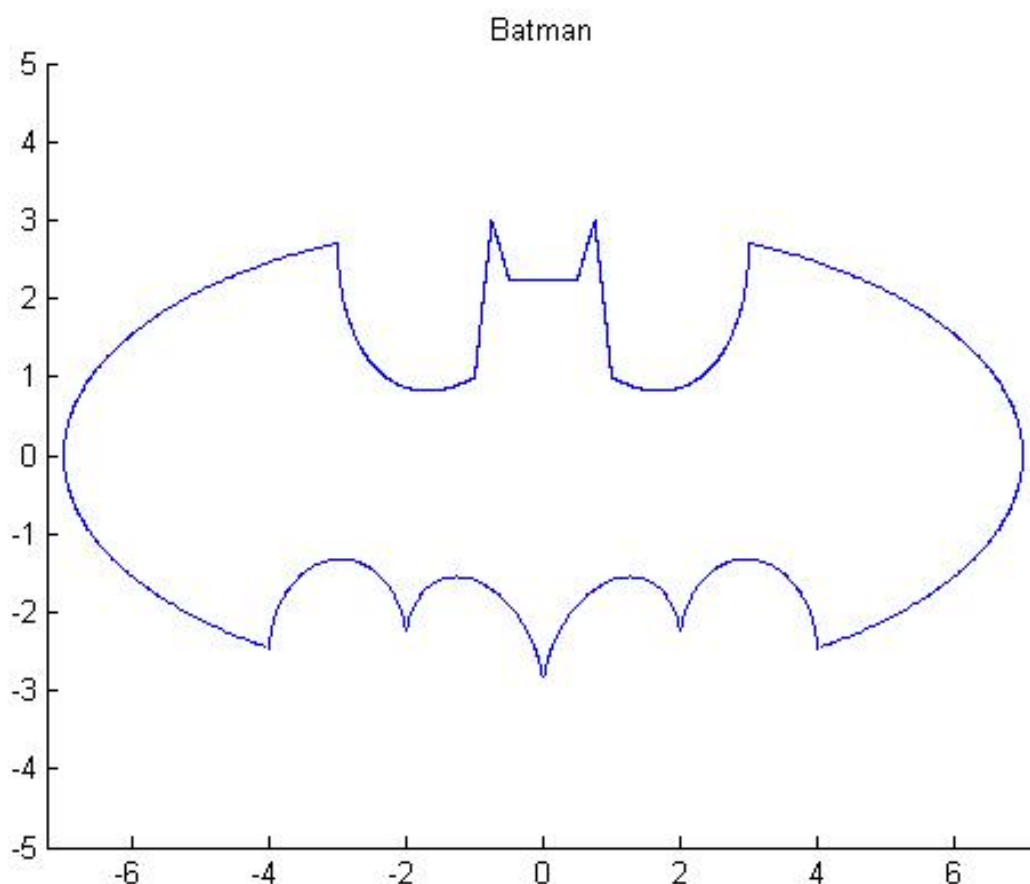
$$\frac{|x|}{2} + \sqrt{1 - (||x| - 2| - 1)^2} - \frac{1}{112} (3\sqrt{33} - 7)x^2 - y - 3 \leq 0$$

or $y \geq 0$ and $\frac{3}{4} \leq |x| \leq 1$ and $-8|x| - y + 9 \geq 0$ or

$$\frac{1}{2} \leq |x| \leq \frac{3}{4} \text{ and } 3|x| - y + \frac{3}{4} \geq 0 \text{ and } y \geq 0 \text{ or } |x| \leq \frac{1}{2} \text{ and } y \geq 0 \text{ and } \frac{9}{4} - y \geq 0$$

or $|x| \geq 1$ and $y \geq 0$ and $-\frac{|x|}{2} - \frac{3}{7} \sqrt{10} \sqrt{4 - (|x| - 1)^2} - y + \frac{6\sqrt{10}}{7} + \frac{3}{2} \geq 0$

...you couldn't do this:



Reading Math

$$x^2 - 7x + 10 = 0$$

- There is a lot more reading in math than just word problems.
- Math uses numbers, variables and symbols to communicate.
- We (our brains) translate these symbols into words and statements, or possibly a question.
- That is why math is universal - people may speak a different language but we all read and understand the same math problem.

"What number(s) when squared, subtract seven times that number and then add ten equals zero"

If you take all the possible math courses the last problem you might be asked to solve is this one:

$$2 \int_{-1}^1 \sqrt{1 - x^2} dx$$

Seems very complicated, but remember, you have not been taught how to read it. You have not been told what all of the symbols represent.

Try this question:

Calculate the area of a circle (Area = πr^2) with a radius of 1.

$$\begin{array}{l} \text{Area of circle} \\ \text{with radius 1} \end{array} = 2 \int_{-1}^1 \sqrt{1 - x^2} dx$$

Mind Blowing Fact:

All anyone can do is add
and subtract numbers.

+ -



Everything else is just the order in which
numbers are added or subtracted.

$6 \times 4 =$ add 6 together 4 times $= 6 + 6 + 6 + 6 = 24$

$10 \div 5 =$ how many times does 5 have to add to
itself to total 10?

$3^2 =$ Multiply 3 by itself twice

$= 3 \times 3 =$ add 3 to itself 3 times

$= 3 + 3 + 3 = 9.$

$$\begin{array}{c}
 2 \times 3^3 - 4 \times 3 \\
 \downarrow \quad \downarrow \\
 2 \times (3 \times 3 \times 3) - (4 + 4 + 4) \\
 \downarrow \\
 2 \times [(3+3+3) \times 3] - 12 \\
 \downarrow \\
 2 \times (9 \times 3) - 12 \\
 \downarrow \\
 2 \times (9+9+9) - 12 \\
 \downarrow \\
 2 \times (27) - 12
 \end{array}$$

This is why we have math shortcuts!!

$$\begin{array}{c}
 27 + 27 - 12 \\
 54 - 12
 \end{array}$$

(42)

Even the most complicated mathematics is
composed of shortcuts for addition and
subtraction.

$$21x^{-4.5} + x^{3/4\pi} - x^2 - 7x = y^3 - 4$$

$$2 \int_{-1}^1 \sqrt{1-x^2} dx$$

Today's Information Agenda

- Room 721
 - > Desks (they are not for garbage)
 - > Garbage cans (they are for garbage)
 - > White boards
 - > Seating Assignment
 - > Extra pencils and paper
 - > Hats
 - > BYOD/Wi-Fi
 - Personal electronics
 - Agreement form
- STEM Club
 - > Fall 2015 release
- Course Outline
 - > Contact Information
 - > Topics
 - > Resources
- JMH & Course Webpage