

# THE MAP OF MATHEMATICS

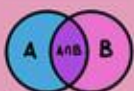
## FOUNDATIONS

### FUNDAMENTAL RULES

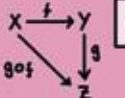
#### MATHEMATICAL LOGIC

$$p \Rightarrow q$$

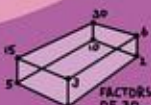
#### SET THEORY



CONSISTENT SET OF AXIOMS?  
GÖDEL INCOMPLETENESS THEOREMS



#### CATEGORY THEORY



#### ORDER THEORY

## THEORY OF COMPUTATION

00011100

$P \neq NP?$

COMPLEXITY THEORY

#### PARTITION THEORY



#### GRAPH THEORY



#### GROUP THEORY



PERMUTATION GROUP

## PURE MATHEMATICS

### TOPOLOGY



1 HOLE (GENUS 1)

#### DIFFERENTIAL GEOMETRY

#### COMPLEX ANALYSIS



#### BUTTERFLY EFFECT

#### CHAOS THEORY



#### ECOSYSTEMS

#### DYNAMICAL SYSTEMS

#### FLUID FLOW



ECOSYSTEMS



MADELBROT SET



PYTHAGORAS

#### TRIGONOMETRY



VECTOR CALCULUS

DIFFERENTIAL EQUATIONS

VECTOR CALCULUS

CARDINAL NUMBERS  
 $\aleph_0$  ALPH NULL

OCTONION  
 $\{e_0, e_1, e_2, e_3, e_4, e_5, e_6, e_7\}$

QUATERNION  
 $a+bi+cj+dk$

PI  
 $\pi$

EXPONENTIAL  
 $e$

COMPLEX NUMBERS  
 $3, i, 4+3i, -4i$

REAL NUMBERS  
 $-4\pi, \sqrt{2}, e$

RATIONAL NUMBERS  
 $-7, \frac{1}{2}, 2.32$

INTEGERS  
 $\dots, -2, -1, 0, 1, 2, \dots$

NATURAL NUMBERS  
 $1, 2, 3, 4, 5, \dots$

ARITHMETIC  
 $+$   
 $-$   
 $\times$   
 $\div$

## NUMBER SYSTEMS

LINEAR ALGEBRA  
 $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \cdot \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} = \begin{bmatrix} 17 & 20 \\ 26 & 32 \end{bmatrix}$

MATRICES  
 $\begin{pmatrix} 6 & 7 \\ -3 & 2 \end{pmatrix}$

ALGEBRA  
 $x^2 - 4x + 3 = 0$   
 $x^2 - 4x + 3 = (x-1)(x-3) = 0$

EQUATION  
 $y = mx + c$

VECTORS  
 $\vec{x}$

## STRUCTURES

## SPACES

## CHANGES

## CALCULUS

DIFFERENTIAL  
GRADIENT =  $\frac{dy}{dx}$

INTEGRAL  
AREA =  $\int_a^b f(x) dx$



DIFFERENTIAL EQUATIONS

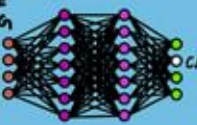
## CRYPTOGRAPHY



## COMPUTER SCIENCE

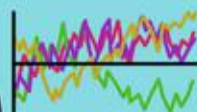
TURING MACHINE

## MACHINE LEARNING



## OPTIMIZATION

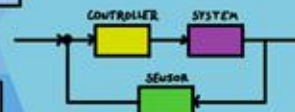
## MATHEMATICAL FINANCE



## ECONOMICS

## APPLIED MATHEMATICS

## ENGINEERING

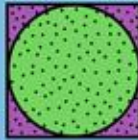


## CONTROL THEORY

## BIOMATHEMATICS



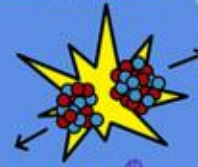
## NUMERICAL ANALYSIS



## MATHEMATICAL CHEMISTRY



## MATHEMATICAL PHYSICS



## THEORETICAL PHYSICS

