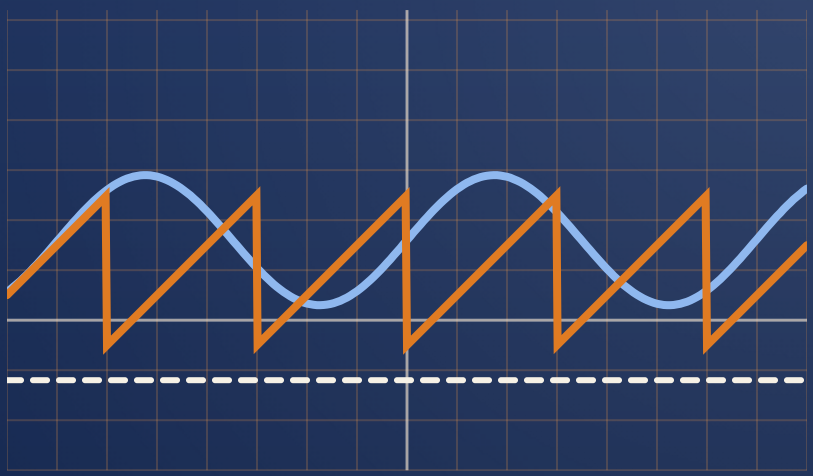
KECUDO

2026 EDITION · COLLEGE MATH SERIES



DISCRETE MATHEMATICS

Class G2

Sets, Functions, Relations & Number Theory

The building blocks, and the math of secrets

PREMIUM EDITION · KECUDO · G2

13 CHAPTERS · 120 SELF-ASSESSMENT QUESTIONS

INTERACTIVE EDITION + PRINT PDF

Contents

Part I · Foundations 4

1. Sets 5
2. Set Operations 7
3. Functions 10
4. One-to-One, Onto & Bijections 12

Part I Review · 10 questions **14**

Part II · Core 16

5. Cardinality & Countability 17
6. Relations 19
7. Equivalence Relations 21
8. Partial Orders 23
9. Modular Arithmetic 25

Part II Review · 10 questions **28**

Part III · Advanced 30

10. Primes & GCD 31
11. The Euclidean Algorithm 33
12. RSA Cryptography 35
13. Boolean Algebra 37

Part III Review · 10 questions **39**

Final Exam · 25 questions **41**

Your Results **46**

FOUNDATION

Chapter 1

Sets

A **set** is an unordered collection of distinct objects, its **elements**. Write $x \in A$ for "x is in A".

Notation	Meaning
{1, 2, 3}	roster form
{x ∈ Z : x > 0}	set-builder form: positive integers
∅	the empty set
A ⊆ B	every element of A is in B
|A|	number of elements
P(A)	power set: all subsets of A

WORKED EXAMPLE **Power set of {regular, e-bike, cargo}**

1. Subsets: ∅, three singletons, three pairs, and the whole set.

✓ $2^3 = 8$ subsets

IMPORTANT NUMBER SETS

N (natural numbers), Z (integers), Q (rationals), R (reals): N ⊆ Z ⊆ Q ⊆ R.

FOUNDATION

Chapter 2

Set Operations

Operation	Symbol	Elements in
union	A ∪ B	A or B
intersection	A ∩ B	A and B
difference	A − B	A but not B
complement	A^c	not in A
Cartesian product	A × B	ordered pairs (a, b)

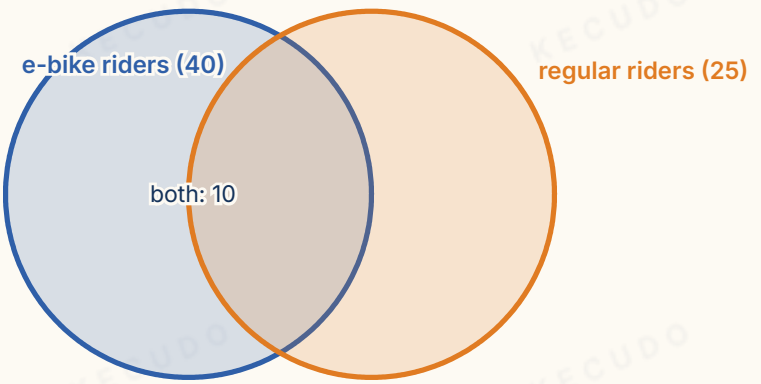


FIG 2.1 A Venn diagram of Kecudo's riders this week.

Inclusion–exclusion: $|A \cup B| = |A| + |B| - |A \cap B|$

CHECK YOUR UNDERSTANDING

Chapter 1: Sets

5 questions · your answer locks when you choose it

1. How many subsets does a 4-element set have?

A 8 | **B** 4

C 12 | **D** 16

2. Is ∅ a subset of every set?

A Only of finite sets | **B** Yes

C No | **D** Only of ∅

3. $|\{a, b, c, a\}|$ =

A 2 | **B** 1

C 4 | **D** 3

4. Which is true?

A $Q \subseteq Z$ | **B** $R \subseteq N$

C $Z \subseteq N$ | **D** $Z \subseteq Q$

5. $\{x \in Z : 0 < x < 4\}$ =

A {0, 1, 2, 3} | **B** {1, 2, 3, 4}

C {0, 1, 2, 3, 4} | **D** {1, 2, 3}

FINAL EXAM

25 Questions on the Whole Book

Parts A–E · 5 questions each

Part A · Basics

1. $|A \cup B| =$

A $|A| + |B|$ **B** $|A||B|$

C $|A| + |B| - |A \cap B|$ **D** $|A \cap B|$

2. A bijection is:

A constant **B** one-to-one only

C one-to-one and onto **D** onto only

3. An equivalence relation is:

A a partial order **B** a function

C antisymmetric **D** reflexive, symmetric, transitive

4. $a \equiv b \pmod{n}$ means:

A $n \mid (a - b)$ **B** $a = b$

C $a \mid n$ **D** $n \mid a$

5. RSA security depends on:

A nothing **B** large primes being rare

C the difficulty of factoring **D** easy gcds



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Thank you for learning with Kecudo.

NEXT IN THE SERIES

Class G3 · Counting & Combinatorics