1 Fundamentals

Section 1.1: Introduction to Sets

This section introduces the basics of set notation and highlights several special sets.

Learning Objectives

- State the definition of a set.
- Use the roster or set-builder method to describe a set.
- Define the special sets $\mathbb{Z}, \mathbb{N}, \mathbb{R}, \mathbb{Q}$, and $\emptyset$.

Section 1.2: The Cartesian Product

This section introduces a type of set operation called the Cartesian product. The Cartesian product is a way of using two sets to make a new set. This new set consists of ordered pairs of elements from the first two sets, for example, our good friend $\mathbb{R}^2$.

Learning Objectives

- State the definitions of ordered pair, coordinates, and the Cartesian product of two sets.
- Visualize Cartesian products of sets of real numbers in the plane.

Section 1.3: Subsets

This section introduces the concept of a subset, when every element in a given set is an element of another set.

Learning Objectives

- State the definition of a subset.
- List all of the subsets of a given set.

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Section 1.4: Power Sets

This section introduces the concept of a power subset of a set A, which is the set of all subsets of A.

Learning Objectives

- State the definition of a power set.
- Determine the power set of a given set.

Section 1.5: Union, Intersection, Difference

This section introduces several ways to perform operations on sets (analogous to operations like addition and multiplication with numbers)

Learning Objectives

- State the definition of union, intersection, and difference.
- Determine union, intersection, and/or difference of given sets.