Title

Julian Pagcaliwagan

Sets

Definitions

Definition 1 (Sets)**.** A set is an **unordered** collection of objects called elements, denoted by {}

Definition 2 (Classifications of numbers)**.** We can categorize classifications of numbers as sets. We have

- $\mathbb{Z} = \{-2, -1, 0, 1, 2, ...\}$
- $\mathbb{N} = \{0, 1, 2, 3, ...\}$
- $\varnothing = \{\}$
- $\mathbb{Q} = \left\{\frac{a}{b} : a, b \in \mathbb{N}, b \neq 0\right\}$

The last item, the rationals calls to mind set builder notation, where sets can be built with conditions. We can invoke set-builder notation:

$$\{\text{elements} : \text{conditions used to generate the elements}\}$$

Since math is a logical and interpretable language, we can interpret the set-builder notation of the rationals to be

$$\mathbb{Q} = \left\{\frac{a}{b} : a, b \in \mathbb{N}, b \neq 0\right\}$$

The set of all rational numbers is defined to be the set of all fractions in the form $\frac{a}{b}$ such that a and b are integers and b is nonzero.

Proving $A \subseteq B$