

MATH 140A Review: Set builder notation in \mathbb{R}

Facts to Know:

A set S in \mathbb{R} is a

For example,

$$\mathbb{N} =$$

$$\{2, 4, 6, 8, \dots\} =$$

$$[0, 1) =$$

Notation:

• (belongs) $\{2, 4, 6, 8, \dots\}$

• (does not belong) $\{2, 4, 6, 8, \dots\}$

• (subset) $A \subset B \iff$

$$\{2, 4, 6, 8, \dots\}$$

• (the empty set) \emptyset

Example: Simplify the notation:

1. (union)

$$[0, 1) \cup [1/2, 2]$$

2. (intersection)

$$[0, 1) \cap [1/2, 2]$$

3. (complement)

$$[0, 1)^c$$

Example: Describe the following sets:

1. (integer numbers \mathbb{Z})

2. (rational numbers \mathbb{Q})

3. (irrational numbers)

x is irrational if and only if $x \notin \mathbb{Q}$