

- **Homework:** Watch videos 1.4 - 1.6.

What are the following sets?

- 1  $(2, 4] \cup (3, 5]$
- 2  $(-\infty, 4] \cap [3, \infty)$
- 3  $[4, 2)$
- 4  $(0, 0)$
- 5  $[0, 0]$

What are the following sets?

1  $\{x \in \mathbb{N} : x^2 < 6\}$

2  $\{x \in \mathbb{Z} : x^2 < 6\}$

3  $\{x \in \mathbb{R} : x^2 < 6\}$

What are the following sets?

- 1  $\{x \in \mathbb{R} : \forall y \in [0, 1], x < y\}$
- 2  $\{x \in \mathbb{R} : \exists y \in [0, 1] \text{ s.t. } x < y\}$
- 3  $\{x \in [0, 1] : \forall y \in [0, 1], x < y\}$
- 4  $\{x \in [0, 1] : \exists y \in [0, 1], x < y\}$
- 5  $\{x \in [0, 1] : y \in [0, 1], x < y\}$
- 6  $\{x \in [0, 1] : \exists y \in \mathbb{R} \text{ s.t. } x < y\}$

## New set operations: Set difference

Given two sets  $A$  and  $B$ . We define

$A \setminus B := \{x \in A : x \notin B\}$ . This set is called “A minus B”.

What are the following sets?

- 1  $[0, 1] \setminus (-0.5, 1)$
- 2  $[0, 1] \setminus (1, \infty)$
- 3  $\mathbb{R} \setminus [0, 1]$
- 4  $[0, 1] \setminus \mathbb{R}$

- 1  $A := \{\text{Students who like cats more than dogs}\}$
- 2  $B := \{\text{Students who are Raptors fans}\}$
- 3  $C := \{\text{Students who like math}\}$

Raise your hand if you are in  $(A \setminus B) \cup (B \setminus A)$ .

- 1  $A := \{\text{Students who like cats more than dogs}\}$
- 2  $B := \{\text{Students who are Raptors fans}\}$
- 3  $C := \{\text{Students who like math}\}$

Raise your hand if you are in  $C \setminus (B \setminus C)$ .

## Set description: even integers

Let  $S$  be the set of even integers. Write  $S$  in set-building notation.

## Set description: rational numbers

Let  $S$  be the set of rational numbers. Write  $S$  in set-building notation.