

Reminders on absolute value

The real numbers have an *algebraic* structure, an *order* structure, and also a *metric* structure.

In \mathbb{R} , the quantity $|x - y|$ represents the *distance* between x and y .

Example

The inequality $|x - 5| < 3$ is equivalent to the double inequality $5 - 3 < x < 5 + 3$, or $2 < x < 8$.

The inequality $|x - 3| < 5$ is equivalent to $-2 < x < 8$.

The triangle inequality

- ▶ $|x + y| \leq |x| + |y|$, and $|x - y| \leq |x| + |y|$
- ▶ $|x| - |y| \leq |x - y|$, and $|y| - |x| \leq |x - y|$

Assignment due next class

- ▶ Write solutions to Exercises 1.3.2 and 1.4.6.
- ▶ Read the first part of section 2.1 in the textbook, through Example 2.1.8.