

Set Builder Notation

Recap from GCSE:

- We use curly braces to list the values in a set, e.g. $A = \{1,4,6,7\}$
- If A and B are sets then $A \cap B$ is the **intersection** of A and B , giving a set which has the elements in A **and** B .
- $A \cup B$ is the **union** of A and B , giving a set which has the elements in A **or** in B .
- \emptyset is the empty set, i.e. the set with nothing in it.
- Sets can also be infinitely large. \mathbb{N} is the set of natural numbers (all positive integers), \mathbb{Z} is the set of all integers (including negative numbers and 0) and \mathbb{R} is the set of all real numbers (including all possible decimals).
- We write $x \in A$ to mean " x is a member of the set A ". So $x \in \mathbb{R}$

Examples:

1. $\{2x : x \in \mathbb{Z}\}$

2. $\{2^x : x \in \mathbb{N}\}$

3. $\{xy : x, y \text{ are prime}\}$

Solving Inequalities

Linear inequalities Examples

1. $2x + 1 > 5$

2. $3(x - 5) \geq 5 - 2(x - 8)$

3. $-x \geq 2$

Combining Inequalities

When combining inequalities always draw a number line to help!

Example:

If $x < 3$ and $2 \leq x < 4$, what is the combined solution set?