

Set Notation

Examples & Non-Examples

✓ Example	✓ Example	✗ Non-Example	✗ Non-Example
$\{x x > 3\}$	$\{y 0 \leq y \leq 5\}$	$0 \leq y \leq 5$	$[0, 5]$

Definition

Set notation is another way to describe the domain and range of functions. It provides a formal method to specify the sets of input and output values using set-builder notation or roster notation. Here's how it works:

Domain

The **domain** of a function is the set of all possible input values (x) for which the function is defined.

Set Notation Examples for Domain:

- **Set-Builder Notation:** Describes the domain using a rule or condition. For instance, if the domain includes all x values greater than 3, it can be written as:

$$\{x|x > 3\}$$

This reads as "the set of all x such that x is greater than 3."

- **Roster Notation:** Lists specific values explicitly. For example, if the domain is just the values 1, 2, and 3, it can be written as:

$$\{1, 2, 3\}$$

Range

The **range** of a function is the set of all possible output values (y) that the function can produce.

Set Notation Examples for Range:

- **Set-Builder Notation:** Describes the range using a rule or condition. For instance, if the range includes all y values between 0 and 5, inclusive, it can be written as:

$$\{y|0 \leq y \leq 5\}$$

This reads as "the set of all y such that y is between 0 and 5, inclusive."

- **Roster Notation:** Lists specific values explicitly, though this is less common for ranges because ranges often involve continuous sets. For example, if the range is just the values 1, 4, and 9, it can be written as:



$$\{1, 4, 9\}$$

Summary

- **Set-Builder Notation:** Uses a rule or condition to describe the set. It's useful for representing domains and ranges that involve inequalities or specific criteria.
- **Roster Notation:** Lists the elements explicitly. It's useful for finite sets or discrete values.

Set notation helps to clearly define the sets of possible inputs and outputs in a precise mathematical language.

