6.3 Domain and Range of a Function.

**Domain:** The set of all numbers for which the independent variable is defined.

\[ y = 2x + 4 \]

\[ \uparrow \text{independent variable.} \]

1. The first numbers in coordinate, \((x, y)\)
2. The left side in a table of values \(x/y\)
3. The values on the horizontal axis

**Range:** The set of all numbers for which the dependent variable is defined.

\[ y = 2x + 4 \]

\[ \uparrow \text{dependent variable.} \]

1. The second coordinate
2. The right side on a table of values
3. The values on the vertical axis

**Example 1:**

\[ (-6, 5) \]

\[ (3, -4) \]

**Domain**

- Words: All x-values between -6 and 3. Include -6, do not include 3.
- Interval notation: \((-6, 3)\)
- Set notation: \(\{x \mid -6 \leq x \leq 3, x \in \mathbb{R}\}\)

**Range**

- Words: All y-values between 5 and -4. Include 5, do not include -4.
- Interval notation: \((-4, 5]\)
- Set notation: \(\{y \mid -4 < y \leq 5, y \in \mathbb{R}\}\)
Ex 2

Domain: \((-2, \infty)\)
\[\{x | x > -2, x \in \mathbb{R}^2\}\]

Range: \((-2, \infty)\)
\[\{y | y > -2, y \in \mathbb{R}^2\}\]

Ex 3

Domain: \((-\infty, -2)\)
\[\{y | y < -2, y \in \mathbb{R}^2\}\]

Range: \((-\infty, -2)\)
\[\{y | y < -2, y \in \mathbb{R}^2\}\]

Ex 4

Domain: \(\mathbb{R}^2\)

Range: \(\mathbb{R}\)

Ex 5

Domain: \(\{x | -2, 1, 3\}\)

Range: \(\{y | -2, 1\}\)

For discrete data, just list the x-values, list the y-values.