3-2 Functions

Recall.

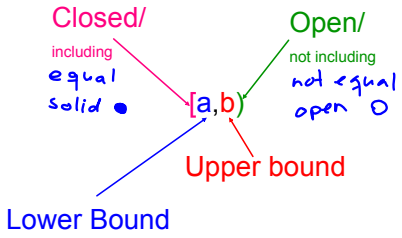
Function: when each domain value is paired with only one range value (no repeating x's)

- graphically: passes the vertical line test

Function notation: f(x) "f of x"

means: function named f is written using x's

Interval Notation



If the interval goes on forever we can use the infinity symbol (∞)

Set Notation

Set Notation is used to represent a group of values (elements)

2 ways to use set notation:

1. {list each element in the set}

examples:

Who are the students sitting in your row?

{ John, Jack, George }

What are the shoe sizes of the students in your row?

Set Notation

2. {variable being defined | variable description}

| means "such that"

Example: $\{x \mid x \geq 5\}$

Use this when your set is too large to list!

Examples:

How much money can a person earn in a lifetime?

$\{x \mid x \text{ is a real number}\}$

All numbers less than 7.

$\{x \mid x < 7\}$

Write each set in interval and set notation.

"All real numbers greater than or equal to 2 but less than 9."

$[2, 9)$

$\{x \mid 2 \le x < 9\}$

"All real numbers greater than or equal to -7."

$[-7, \infty)$

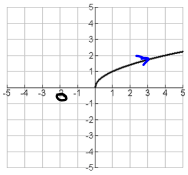
$\{x \mid x \ge -7\}$

Domain & Range

Domain: The set of all inputs
x
"the set of all x-values" (when applicable)
"independent variable"

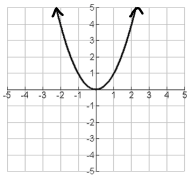
Range: The set of all outputs
y
"the set of all y-values" (when applicable)
"dependent variable"

State the Domain & Range in both interval and set notation:



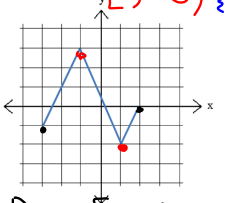
Dom: $[0, \infty)$ $\{x \mid x \ge 0\}$

Ran: $[0, \infty)$ $\{y \mid y \ge 0\}$

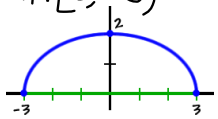


Dom: $(-\infty, \infty)$

Ran: $[0, \infty)$



Dom: $[-3, 3]$



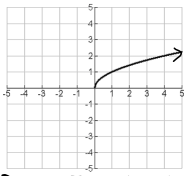
Dom: $[-3, 2]$ $\{x \mid -3 \le x \le 2\}$

Ran: $[0, 2]$

Ran: $[-2, 3]$ $\{y \mid -2 \le y \le 3\}$

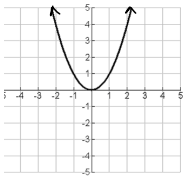
You try!

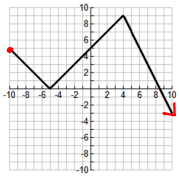
State the Domain & Range in both interval and set notation:



Dom: $[0, \infty)$ $\{x \mid x \ge 0\}$

Ran: $[0, \infty)$ $\{x \mid x \ge 0\}$





Dom: $[-10, \infty)$

Ran: $(-\infty, 9]$