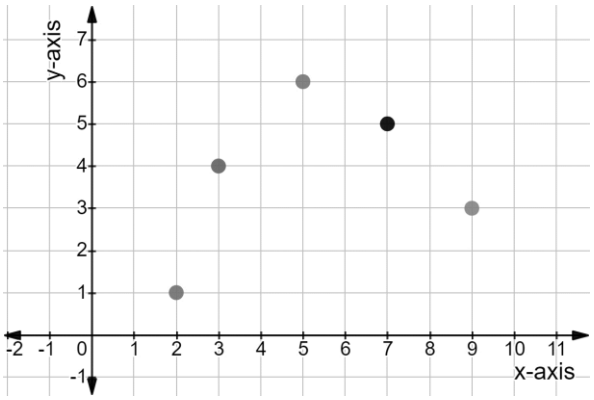
Name: Date: Period:

A domain can either be discrete or continuous.

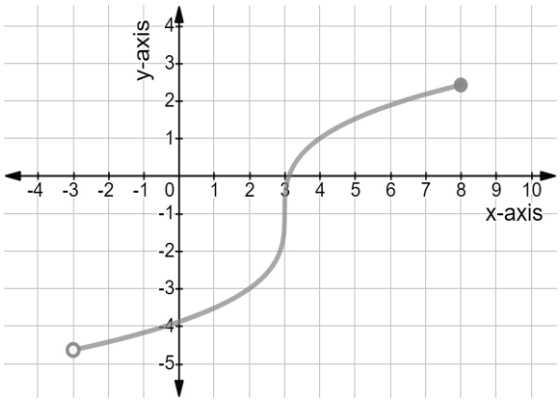
Discrete (Not Connected)

- A **discrete** function would have x-values that stand alone, but not have an interval around them.
- For example, the number of children you have will be 0, 1, 2, 3, … but numbers in between 1 and 2 do not make sense so are **NOT** included.
- The visual of a discrete function is just a bunch of **non-connected** points because all the values in between do not count as input values.

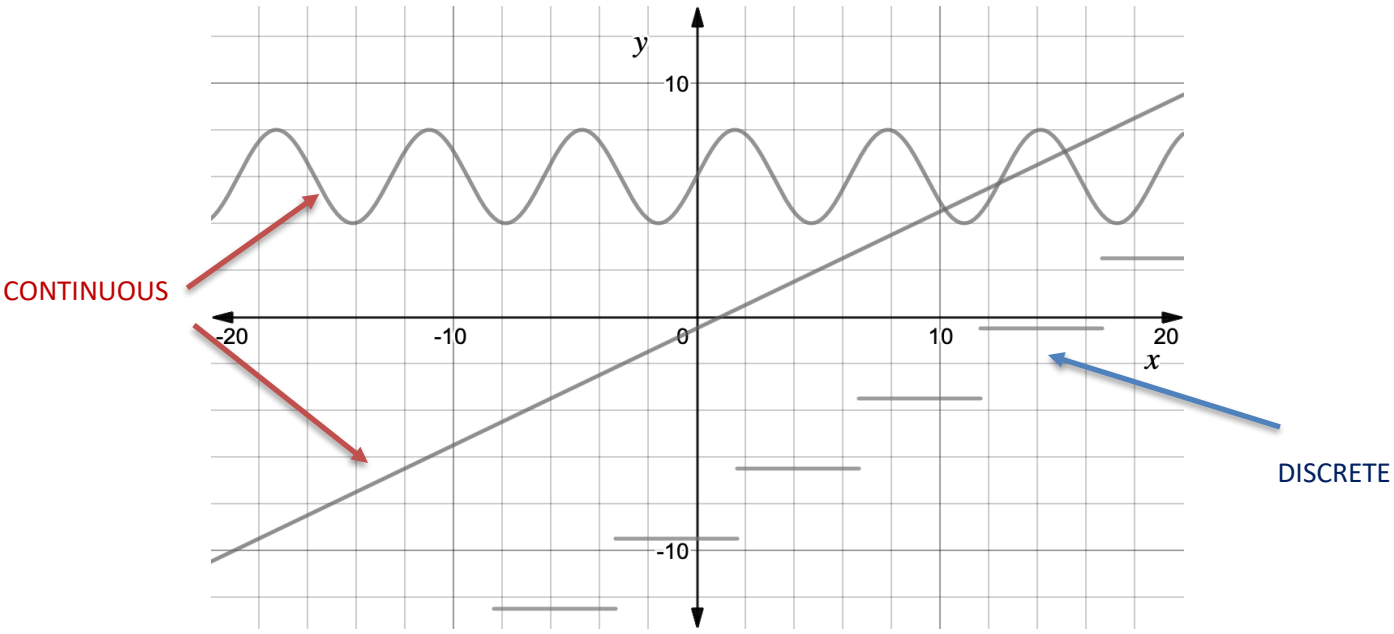


Continuous (Connected)

- A **continuous** function will have **ALL** values of x in an interval.
- For example, things like time and weight can be broken down into extremely specific increments, therefore all the numbers in between **ARE** included.
- The visual of a continuous function is shown by points **connected** by lines, indicating that values in between two #s can be input values.



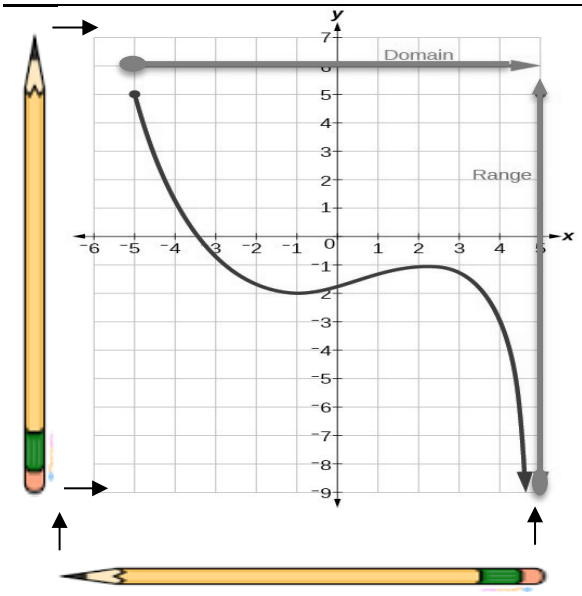
Continuous functions are graphs where there is a value of y for every single value of x, and each point is **immediately** next to the point on either side of it so that the line of the graph is **uninterrupted**. If the line is continuous, the graph is continuous.



The **domain** refers to the set of possible **input** values. The **range** is the set of possible **output** values. When identifying the domain and range, determine if the domain is discrete or continuous.

If discrete, you must list **all** the x-values and y-values **separately**.

If continuous, the domain and range can be written using several different notations since **ALL** points are **INCLUDED**.
The following examples are continuous so we can use set notation, interval notation, and inequality notation.



To Determine **Domain:**

Slide your pencil from left to right.

- The first "point" you hit, determines the **beginning** of your domain. *
- The last "point" you hit, determines the **end** of your domain. *

To Determine **Range:**

Drag your pencil from bottom to top.

- The first "point" you hit, determines the **beginning** of your range. *
- The last "point" you hit, determines the **end** of your range. *

Set Notation:

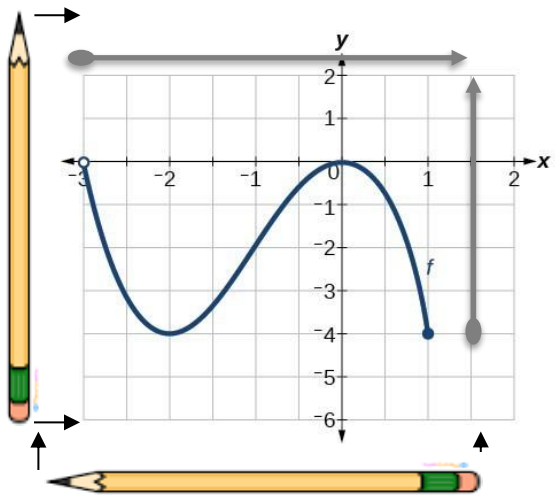
D: {x|x is all real #s ≥ -5} R: {y|y is all real #s ≤ 5}

Interval Notation:

D: [-5, ∞) R: (-∞, 5]

An Inequality:

D: $x \geq -5$ R: $y \leq 5$



To Determine **Domain**

Slide your pencil from left to right.

To Determine **Range**

Drag your pencil from bottom to top.

Set Notation:

D: {x|x is all real #s > -3 and ≤ 1} R: {y|y is all real #s s ≥ -4 and < 0}

Interval Notation:

D: (-3, 1] R: [-4, 0)

An Inequality:

D: $-3 < x \leq 1$ R: $-4 \leq y < 0$

*To determine the domain and range from a graph, **PAY ATTENTION TO THE START AND END POINTS**:

- Closed Circle INCLUDES the point.
- Open Circle DOES NOT include the point.
- An arrow indicates infinity or negative infinity depending on its location.
- A closed circle overrides an open circle.