## Algebra II <br> Lesson 2: Domain and Range of Parent Functions <br> Mrs. Snow, Instructor

Data may be represented in two different ways: discrete or continuous. In order to decide if a function is continuous or discrete, think about the reasonable domain for the function. Does the domain include all values, or just specific values?

## Vocabulary;

discrete -discrete data does not have any meaning between the points plotted on a graph; you do not connect the points when the data is discrete. In other words, there are only a finite number of values possible. Discrete data usually occurs in a case where there are only a certain number of values, or when we are counting something by using whole numbers or in counting money dollars and cents.
continuous - Continuous data is data that can have any number make sense; meaning any number between the points you plot. Connect points when data is continuous. This is a type of data that is usually associated with some sort of physical measurement.

EXAMPLE: Decide whether the following functions are continuous or discrete.

| Temperature of Heated Water | M\& MActivity |
| :---: | :---: |
| A student group is selling chocolate bars for $\$ 2$ each. The function $f(x)$ gives the amount of money collected after selling $x$ chocolate bars. | Amber accidentally drops a vase out of her $36^{\text {th }}$ floor apartment window. The function $h(t)$ represents the height of the vase after $t$ seconds. |
| Joe starts walking from one end zone on a football field. The function $d(z)$ gives the marked yard line, with $z$ representing Joe's distance from the original end zone. | Sally puts $\$ 100$ of her birthday money into an investment account which gets $2 \%$ interest, compounded monthly. The function $A(m)$ gives the total amount of money in her account after $m$ months. |

INTEVAL NOTATION - for continuous data
An interval is the set of all numbers between two endpoints such as 3 and 5 . To describe an interval, we have used inequalities. Another way to describe an interval is using interval notation. In interval notation the symbols [ and ] are used to include an endpoint in the interval and the symbols ( and ) are used to exclude an endpoint from an interval.

## SET NOTATION - for discrete data

Set notation may be used to describe discrete data by listing from smallest to largest the list of numbers. In this case we use brackets $\{x \mid x=1,3,5,7\}$ using 3 dots following a number means the pattern continues on until the next number listed or to infinity: $\{x \mid x=1,3,5, \ldots 21\}$ or $\{x \mid x=1,3,5,7, \ldots\}$

Examples below are for the newly introduced interval notation. You should already know how to graph discrete data and list it in set notation.

EXAMPLE

| $\begin{gathered} -5<x \leq 3 \\ (-5,3] \end{gathered}$ |  |
| :---: | :---: |
| $\begin{aligned} & x>6 \\ & (6, \infty) \end{aligned}$ |  |

Use interval notation to represent each set of numbers:


For each set of numbers, (a) graph the set on a number line, and (b) write the set in interval notation.


Name the domain and range of each relation using interval notation.


