Algebra II Lesson 2: Domain and Range of Parent Functions 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 <u>continuous</u> or <u>discrete</u>.

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** $\{x | x = 1, 3, 5, 7\}$ using 3 dots following a number means the pattern continues on until the next number listed or to infinity: $\{x | x = 1, 3, 5, ..., 21\}$ or $\{x | x = 1, 3, 5, 7, ...\}$

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

$-5 < x \le 3$ $(-5,3]$	$\begin{bmatrix} -\infty + + + + + + + + + + + + + + + + + + $
$\begin{array}{c} x > 6\\ (6, \infty) \end{array}$	$-\infty \longleftrightarrow + + + + + + + + + + + + + + + + + + $

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.

A x < 6	B −11 < <i>x</i> ≤ 23
C $-9 \le x \le -2 \ or \ x \ge 0$	D $x < 5 or x \ge 17$
E	F $x \neq 8 \text{ and } x \geq -2$

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

