2.2 Relations and Functions

When we solve for a variable, that variable is called the **dependent variable** because its value *depends on* the value(s) of the remaining variable(s). Any remaining variables are called **independent variables** because we are free to select their values.

Objective 2: Find the Domain and Range of a Relation

Definition:	A **relation** is a set of ordered pairs.

Since a graph is a visual representation of the ordered pair solutions to an equation, we consider equations and graphs to be relations because they define a set of ordered pairs. A relation shows the connection between the set of values for the independent variable, called the **domain** (or *input values*), and the set of values for the dependent variable, called the **range** (or *output values*).

Definitions	The **domain** is the set of all values for the independent variable. These are the first coordinates in the set of ordered pairs and are also known as *input values.* The **range** is the set of all values for the dependent variable. These are the second coordinates in the set of ordered pairs and are also known as *output values*.

2.2.5 Find the domain and range of the relation.

2.2.7 Find the domain and range of the relation.

Objective 3: Determine if Relations are Functions

Definition	A **function** is a special type of relation in which each value in the domain corresponds to exactly one value in the range.

2.2.9 Determine whether the relation is a function. Assume x is the independent variable.

Objective 4: Determine if Graphs Represent Functions

Vertical Line Test	If a vertical line intersects (crosses or touches) the graph of a relation at more than one point, then the relation is not a function. If every vertical line intersects the graph of a relation at no more than one point, then the relation is a function.

In the examples below, use the vertical line test to determine if the graph is of a function.

2.2.17

2.2.19