

FUNCTION JUNCTION

DIRECTIONS: Even mathematicians don't always agree on the definitions of some of our most commonly used terms. Below are some descriptions and definitions of three terms commonly used in algebra: **function, domain, and range.** Read each description and then write the definitions of function, domain, and range in your own words.

Description #1

Davidson, D. M. (2001). *Pre-algebra: Tools for a changing world.* Needham: Prentice Hall.

"The table shows the results of a canned food drive.

You can write the data in the table as a **relation**, a set of ordered pairs. The first coordinate of each ordered pair is the number of students in a homeroom. The second coordinate is the number of cans the students in the homeroom collected.

Here is the relationship represented by the table: $\{(25,133), (22,216), (24, 148), (22,195), (20,74), (21, 150)\}$

The braces, {}, indicate that these are all the ordered pairs in the relation. The first coordinates are the **domain** of the relation. The second coordinates are the **range** of the relation.

Some relations are functions. In a **function**, each member of the domain is paired with exactly one member of the range."

(p. 384)

Description #2

Sullivan, M. (2002). *College algebra (6th ed.).* Upper Saddle River: Prentice Hall. Page 95.

"Let X and Y be two nonempty sets of real numbers. A **function** from X into Y is a relation that associates with each element of X a unique element of Y. The X is called the **domain** of the function. For each element x in X, the corresponding element y in Y is called the **value** of the function at x, or the image of x. The set of all images of the elements in the domain is called the **range** of the function."

(p. 95)

Description #3

Collins, W. (2001). *Mathematics Applications and Connections: Course 2.* New York: Glencoe McGraw Hill.

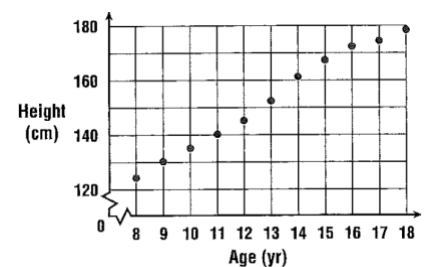
"When Christian Laettner played basketball for Duke University, he was 83 inches, or 211 centimeters, tall. Certainly this is taller than the average 18-year-old.

It is clear from the graph that height increases with age. Height is a **function** of age, which means that height *depends* on age. A function describes a relationship between two quantities."

(p. 249)

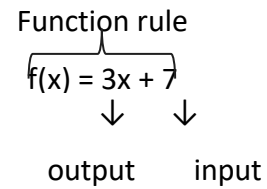
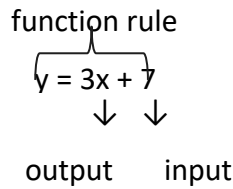
**Food for Life
Canned Food
Drive**

Homeroom	Number of Students	Number of Cans
101	25	133
102	22	216
103	24	148
104	22	195
105	20	74
106	21	150



Description #4

“You can write a function using **function notation**, where you use $f(x)$ instead of y . You read $f(x)$ as “f of x.” You can think of a domain value as an *input* and the resulting range value as the *output*. A **function rule** is an equation that describes a function.”



(p.404)

Description #5

Sullivan, M., & Sullivan, M., III. (2000). *Precalculus: Enhanced with Graphing Utilities (2nd ed.)*. Upper Saddle River: Prentice Hall.

“Many everyday phenomena involve two quantities that are related to each other by some rule of correspondence. The mathematical term for such a rule of correspondence is a **relation**. In mathematics, relations are often represented by mathematical equations and formulas. For instance, the simple interest I earned on \$1000 for 1 year is related to the annual interest rate r by the formula $I = 1000r$.

The formula $I = 1000r$ represents a special kind of relation that matches each item from one set with exactly one item from a different set. Such a relation is called a **function**.

Definition of a Function

A function f from a set A to a set B is a relation that assigns to each element x in the set A exactly one element y in the set B . The set A is the **domain** (or set of inputs) of the function f , and the set B contains the **range** (or set of outputs). [...]

Characteristics of a Function from Set A to Set B

1. Each element in A must be matched with an element in B .
2. Some elements in B may not be matched with any element in A .
3. Two or more elements in A may be matched with the same element in B .
4. An element in A (the domain) cannot be matched with two different elements in B .”

(p. 27)

My definitions:

Function:

Domain:

Range:
