Algebra 2 Notes
Section 1.7 – Function Notation

Name: Key

Some sets of ordered pairs can be described using an equation. When the set of ordered pairs described by an equation satisfies the definition of a function, the equation can be written in function notation.

$f(x) = 5x + 3$

output value (range) — input value (domain)

$f(1) = 5(1) + 3$

output value (range) — input value (domain)

The function described by $f(x) = 5x + 3$ is the same as the function described by $y = 5x + 3$. And both of these functions are the same set of ordered pairs (x , 5x + 3). The graph of a function is a picture of the function's ordered pairs.

Example 1: For each function, evaluate $f(0)$, $f\left(\frac{1}{2}\right)$, and $f(-2)$.

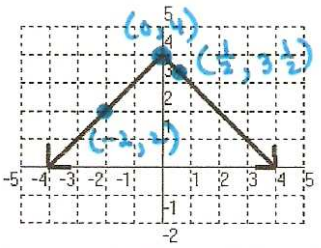
a. $f(x) = 7 - 2x$

$f(0) = 7 - 2(0)$
$= 7 - 0$
$f(0) = 7$

$f\left(\frac{1}{2}\right) = 7 - 2\left(\frac{1}{2}\right)$
$= 7 - 1$
$f\left(\frac{1}{2}\right) = 6$

$f(-2) = 7 - 2(-2)$
$= 7 + 4$
$f(-2) = 11$

b.



$f(0) = 4$, $f\left(\frac{1}{2}\right) = 3\frac{1}{2}$, $f(-2) = 2$

Example 2: What would be a reasonable domain and range for the following?

the number of boxes n of kitchen tile that must be purchased to cover a floor with an area of A square feet

boxes → $\{0, 1, 2, 3, 4, 5, \ldots\}$

area → greater than zero (can have .4 ft²)

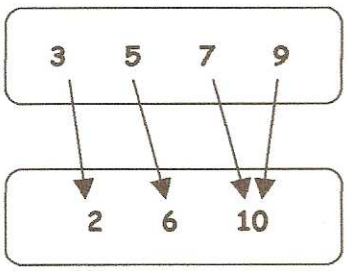
Domain: $\{x \mid x \in \mathbb{W}\}$

Range: $\{y \mid y \geq 0\}$

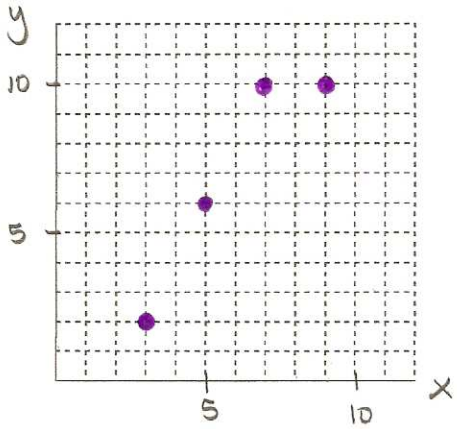
In the notation $f(x)$, f is the name of the function. The output of a function is called the dependent variable because it depends on the input value of the function. The input x is called the independent variable. When a function is graphed, the independent variable is graphed on the horizontal axis and the dependent variable is graphed on the vertical axis.

Example 3: Graph each function.

a.



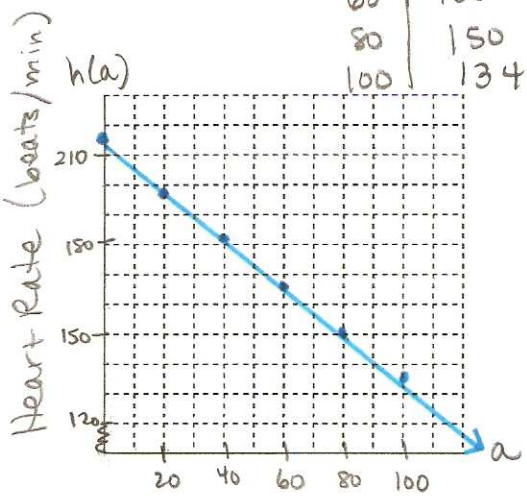
(3, 2)
(5, 6)
(7, 10)
(9, 10)



Do not connect the points b/c the values between the given points have not been defined!

b. The maximum recommended heart rate h for men is a function of age a and can be calculated with $h(a) = 214 - 0.8a$.

a	h(a)
0	214
20	198
40	182
60	166
80	150
100	134



Connect the points w/ a line b/c function is defined for $0 \leq a \leq 100$

A function whose graph is made up of UNCONNECTED points is called a discrete function. Which of the graphs above is a discrete function? # 3 a

The algebraic expression used to define a function is called the function rule. The function described by $f(x) = 5x + 3$ is defined by the function rule $5x + 3$. To write a function rule, first identify the independent and dependent variables.

Example 4: Transportation Application

The Japanese bullet train that travels from Tokyo to Kyoto averages about 156 km/h. The distance from Tokyo to Kyoto is 380 km.

distance depends on time

(a) Write a function to represent the distance remaining on the trip after a certain amount of time.

t = time in hours

d = distance in km remaining

$d(t) = 380 - 156t$

(b) What is the value of the function for an input of 1.5, and what does it represent?

$d(1.5) = 380 - 156(1.5)$

$d(1.5) = 146$

After traveling for 1.5 hours, 146 km of the trip still remain.