

# Functions again

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Algebra 2 Lv 1  
Fri Sept 5

## 1 Warmup

1. Check seating chart
2. Welcome/expectations signatures on desk
3. Got calculators?
4. Consider the function defined by this two-part rule:

$$f(x) = \begin{cases} 0 & \text{if } x \text{ is even} \\ 1 & \text{if } x \text{ is odd} \end{cases}$$

Evaluate:

- a.  $f(2)$
  - b.  $f(153)$
  - c.  $f(0)$
5. If we know that  $f(x) = 1$ , do we know the value of  $x$ ?

## 2 G Block: Textbooks

- Go in alphabetical order
- Find your book (see spreadsheet)
- Write your name & mine (Dreyer) in bookplate immediately

## 3 Classwork/homework head start

Section 2.1, page 71: 9, 10, 15, 16, 24, 25, 27, 33, 42, 50, 52

## 4 Diagnostic test

- Mon Sept 8
- Not “high stakes”
- Very high or very low scores may *be considered* for class changes

## 5 Functions may be thought of as:

- A rule assigning output values to input values
- A rule in the form of an equation, e.g.  $f(x) = x^2 - 1$  or  $y = x^2 - 1$
- A set of ordered pairs in which the first element of any pair is not equal to the first element in any other, sometimes shown as a table. If the function is also expressed as an equation, the ordered pairs represent all the *solutions* to the equation

- A graph, which is just a picture of a set of ordered pairs (what are the ordered pairs?) that obeys the *vertical line test*.
- What does the vertical line test have to do with the “distinct first elements” test of the ordered pairs representation above?

## 6 Functions you already know, but may not think of as functions

- The “double it” function:

$$f(x) = 2x$$

$x$	$f(x)$
1	
	4

- The “negative” function:

$$f(x) = -x$$

(or, if you prefer)  $f(x) = -1x$

$x$	$f(x)$
2	-2
1	
	0

- *Absolute value* function:

$$f(x) = |x|$$

which can also be defined as

$$f(x) = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$

$x$	$f(x)$
-2	2
3	3
	1

- Even operations like addition can be thought of as functions with *two inputs*:

$$f(x_1, x_2) = x_1 + x_2$$

$x_1$	$x_2$	$f(x_1, x_2)$
1	2	3
-4		-1
	7	7

We won't otherwise deal with functions of two inputs for awhile, though.

- Here's a word description of a function: *Square the input number and subtract one.*  
What is the equivalent equation?

$$f(x) = x^2 - 1$$

Here is a table to describe a bit of the function:

$x$	$f(x)$
2	3
1	
	8

## 7 Some buzzwords

- *Domain*: set of legal input ( $x$ ) values
- *Range*: set of legal output ( $y$  or  $f(x)$ ) values
- *Independent variable*: the input variable
- *Dependent variable*: the output variable (think: it *depends* on the independent variable)
- *Linear functions* are functions that can be written  $f(x) = m x + b$  for some numbers  $m$  and  $b$ . What do the graphs of linear functions look like? Is the absolute value function  $f(x) = |x|$  a linear function?

## 8 Relations

- A relation is simply a set of ordered pairs. Unlike a function, the first elements do not have to be distinct
  - Are all functions relations? Are all relations functions?
- What's the difference between the graphs of a function and a relation?
- Is a circle a graph of a function? A relation?
- What equation would generate a graph of a circle centered on  $(0, 0)$  of radius 1? How does this equation differ from an equation that defines a function?
- Does the concept of domain apply to a relation? How about range? Independent variable? Dependent variable?