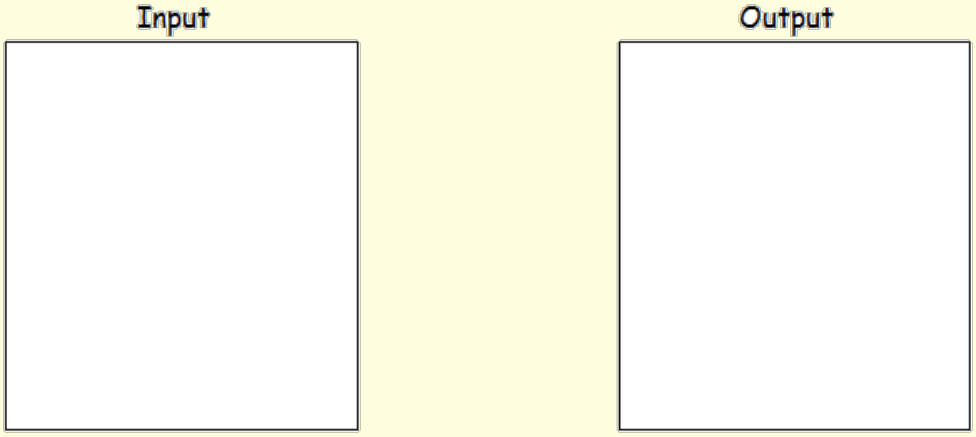
Here's my input,
So draw me, maybe!



The Idea of a Function

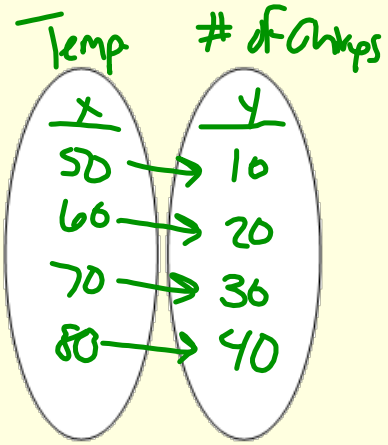
A familiar sound in the country on a warm summer evening is the chirping of crickets. The rate at which crickets chirp depends on the temperature: the warmer it is, the more they chirp in any given time period. The information below shows how the rate and temperature are related.

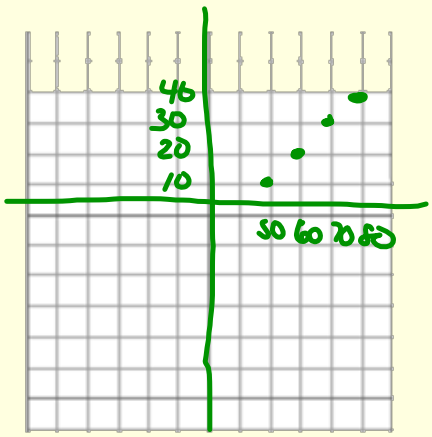
Temperature in degrees Fahrenheit	50	60	70	80	...
Number of chirps in 15 seconds	10	20	30	40	...

The information clearly shows a relationship between the temperature and the rate at which crickets chirp. A mathematician would say that the rate at which crickets chirp is a *function* of the temperature.

We can visually represent a function with a table, a mapping diagram, or a graph.

x: T	y: # chirps
50	10
60	20
70	30
80	40





Temperature in degrees Fahrenheit	50	60	70	80	...
Number of chirps in 15 seconds	10	20	30	40	...

Another way to represent a function is with a formula, or an equation.

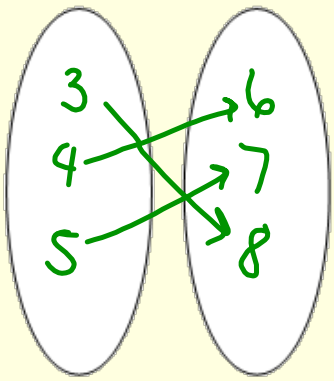
- $C = T - 40$
- $f(t) = t - 40$

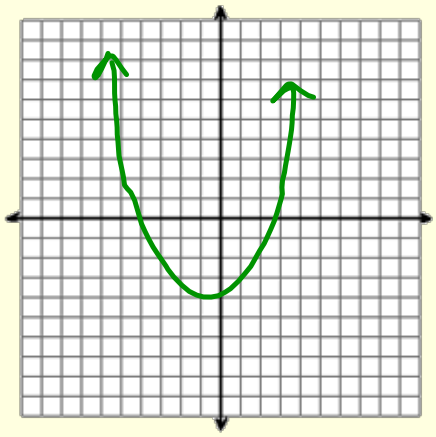
Temperature in degrees Fahrenheit	50	60	70	80	...
Number of chirps in 15 seconds	10	20	30	40	...

The key idea of a function is that it is a set of ordered pairs in which each first component is partnered with exactly one second component. If the first component has more than one partner, then the set is not a function.

Functions:

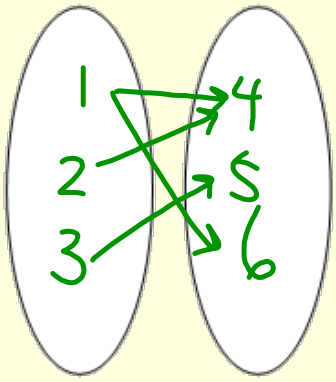
x	y
1	7
2	7
3	7
4	7

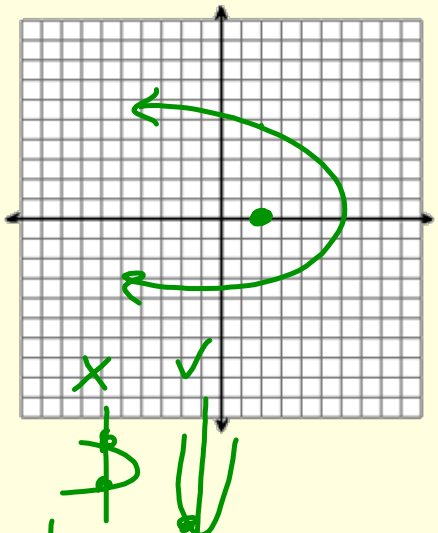




Not Functions:

x	y
1	7
2	7
3	8
2	9





The input of the function is called the x / domain / independent variable

The output of the function is called the y / range / dependent variable

$$f(x) = 3x^2 + 2x - 5$$

$$f(\square) = 3\square^2 + 2\square - 5$$

$f(3) = 3(3)^2 + 2(3) - 5 = 28$

$f(-4) = 3(-4)^2 + 2(-4) - 5 = 35$

$f(a) = 3a^2 + 2a - 5$

$f(\Delta) = 3\Delta^2 + 2\Delta - 5$

$f(p+3) = 3(p+3)^2 + 2(p+3) - 5$

$= 3(p+3)(p+3) + 2(p+3) - 5$

$= 3(p^2 + 3p + 3p + 9) + 2p + 6 - 5$

$= 3(p^2 + 6p + 9) + 2p + 1$

$= 3p^2 + 18p + 27 + 2p + 1$

$= 3p^2 + 20p + 28$

Homework Assignment:

pages 136 and 139

Exercises 4A and 4B