Lecture 08/24/23   Intro to Functions

Recall: A relation is a collection of pairs of numbers (a,b)

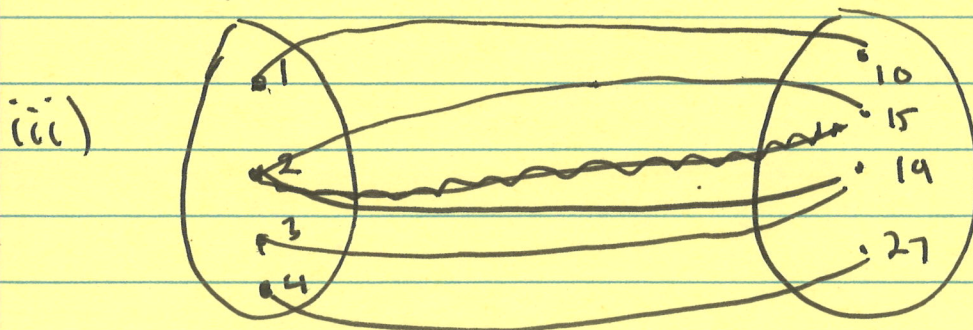Defn: A function is a relation where each x-coord (input) is related to exactly one y-cord (output)

Ex: Determine if the following relations define a function.

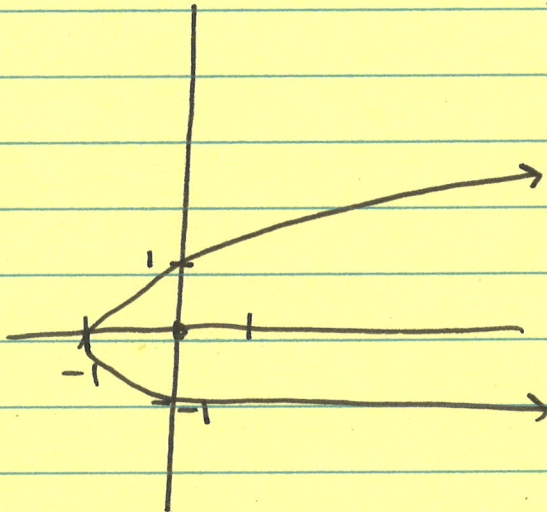i) $\{(2,7),(5,-4),(-3,1),(5,2)\}$ No! 5 relates to -4 and 2

ii)

x	y
-2	4
-1	4
1	4
6	4

Yes! no input is related to more than one output (even though the output is always 4).

iii)

No! 2 is related to 15 and 19

Ex: Decide whether the relation below is a function and give its domain and range

$$f(x) = y$$

D: $[-1, \infty)$

R: $(-\infty, \infty)$

Not a function!
0 relates to 1 and -1.

Will talk about more.

Function Notation: A function is usually written

$$f(x) = y$$

↗ name of function
↑ input
↑ output

We say y (output) is a function of x (input)

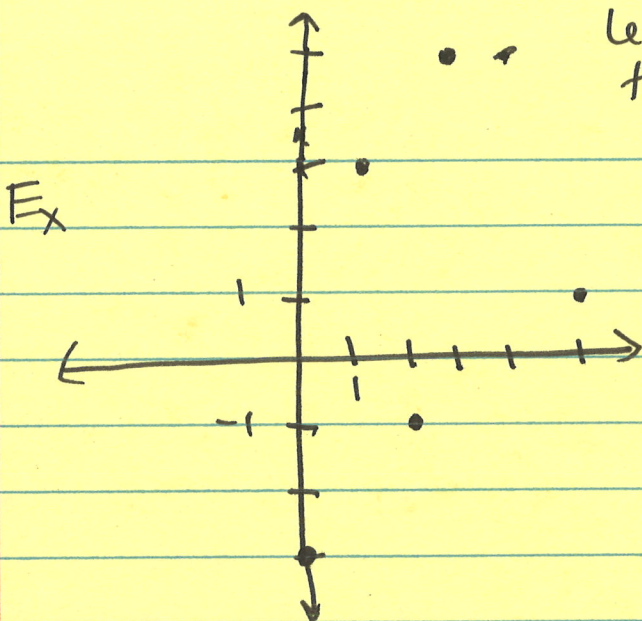Defn We call x the **ind. variable** and y the **dep. variable**

Ex: $f(x) = 3x - 7$

$f(-8) = 3(-8) - 7 = -24 - 7 = \boxed{-31}$

Ex: Given

x	g(x)
1	1
2	4
8	3

$\left(g(8) = 3\right)$

Let h(x) be represented by the graph.

when

For what value(s) of x does h(x) = 5

$$x = 3, \quad x = 4.$$