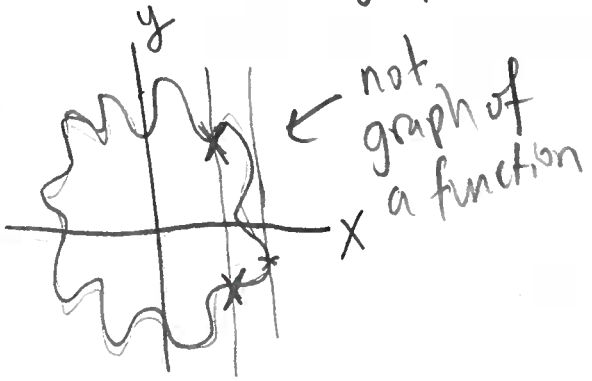
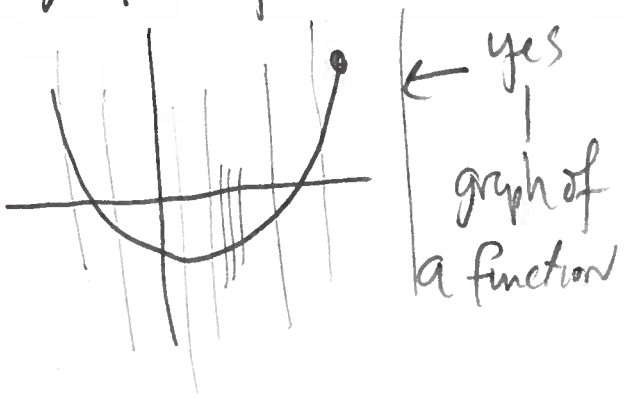
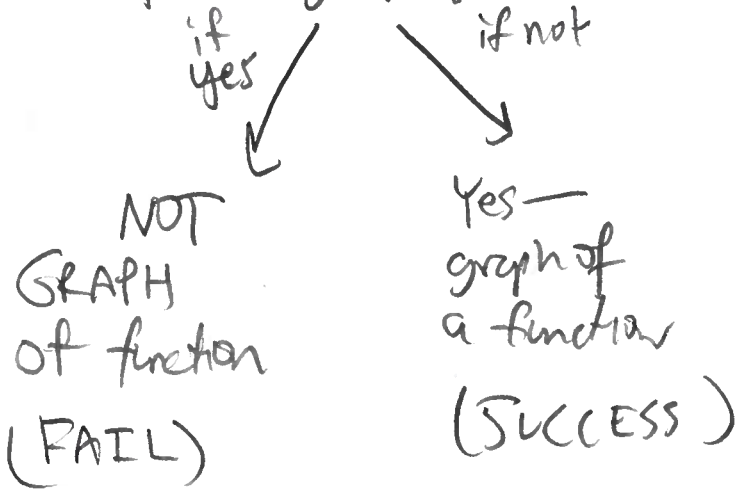
Functions

① vertical line test — shows whether or not a graph is the graph of a function





The test: does any vertical line that is drawn touch more than one point of the graph?



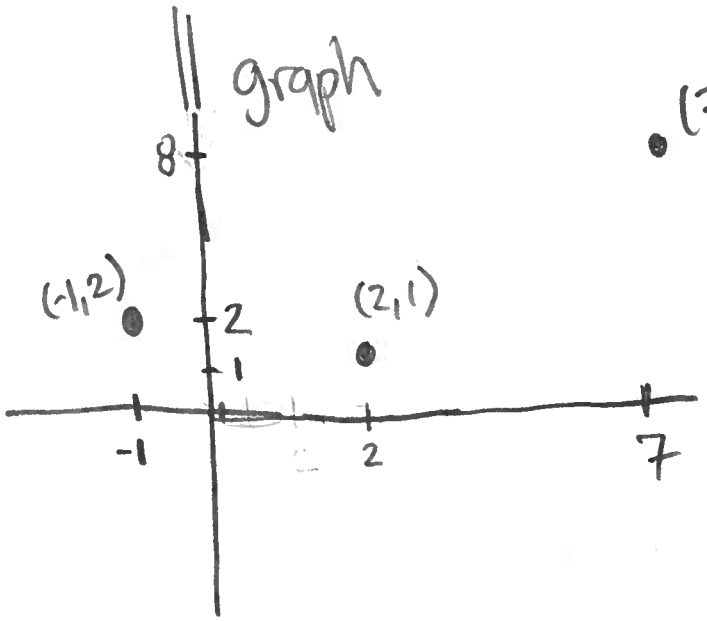
② relation / table of values

Table

x	-1	2	7
y	2	1	8

Relation

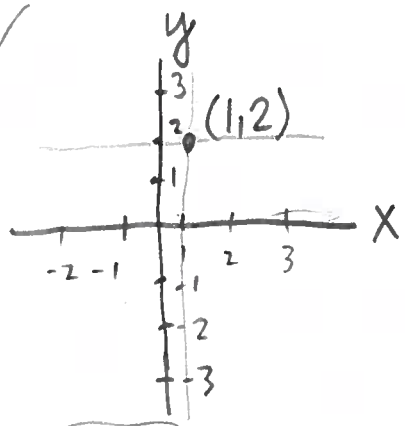
$f = \{(-1,2),(2,1),(7,8)\}$



passes ~~does~~ the vertical line test !!

Our relation is a function.

⇒ Def: A function is a relation whose graph passes the vertical line test.



Ordered pairs

(1, 2)

x-coord. y-coord

(7,8)

sets

A bag to put stuff in

notate:

{object 1, object 2, ...}

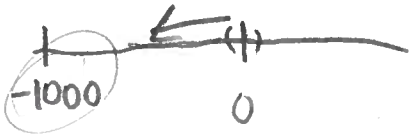
{

Consider table

x	-3	-2	-1	0	1	2	3
y	4	-1	0	15	4	1	1

- What value(s) of of x is $y = 15$?

$\Rightarrow x = 0$



- What values of x have $y \leq 0$?

$x = -2$ and $x = -1$

- For what values of y is $x = 2$?

$y = 1$

- What is the minimum value of y?

$y = -1$

- What x-value does the max y value occur at?

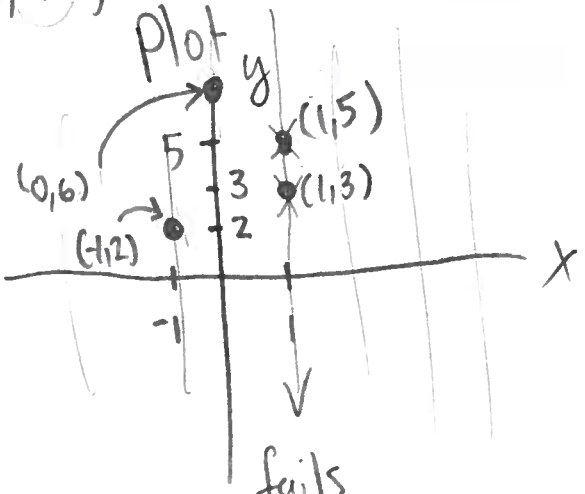
$x = 0$

Consider

$\{(1,5),(0,6),(-1,2),(1,3)\}$

(4)

Plot



fails v line test

$\Downarrow$

this relation is not a function!

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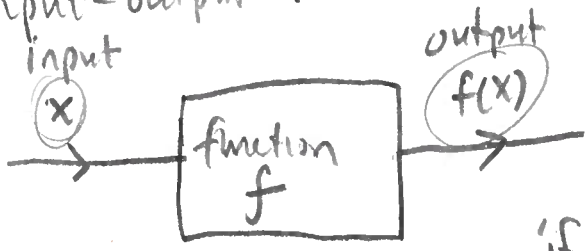
(3) input-output machine



sin $_2F_1$

tan $\frac{d}{dx}$

$f(x) = x^2 + 1$ $\rightsquigarrow$ if $x=2$ $\downarrow$ then $f(2) = 2^2+1 = 5$

input: x output: x^2+1

$\Omega(\text{☺}) = \frac{\text{☺}+1}{\text{☺}^2-3}$

$\Omega(7) = \frac{7+1}{7^2-3} = \frac{8}{46}$

make ☺ = 7