E.g. $h(x) = x^2 - 3x. \longrightarrow (\boxed{})^2 - 3(\boxed{})$

Find $h(\boxed{1})$; $h(\boxed{-1})$; $h(\boxed{2a})$; $h(\boxed{x+1})$.

$h(1) = (1)^2 - 3(1) = \boxed{-2}$

$h(-1) = (-1)^2 - 3(-1) = \boxed{4}$

$h(2a) = (2a)^2 - 3(2a) = \boxed{4a^2 - 6a}$

$h(x+1) = (x+1)^2 - 3(x+1)$

$\qquad = (x+1)(x+1) - 3x - 3$

$\qquad = x^2 + 2x + 1 - 3x - 3$

$\qquad = \boxed{x^2 - x - 2}$
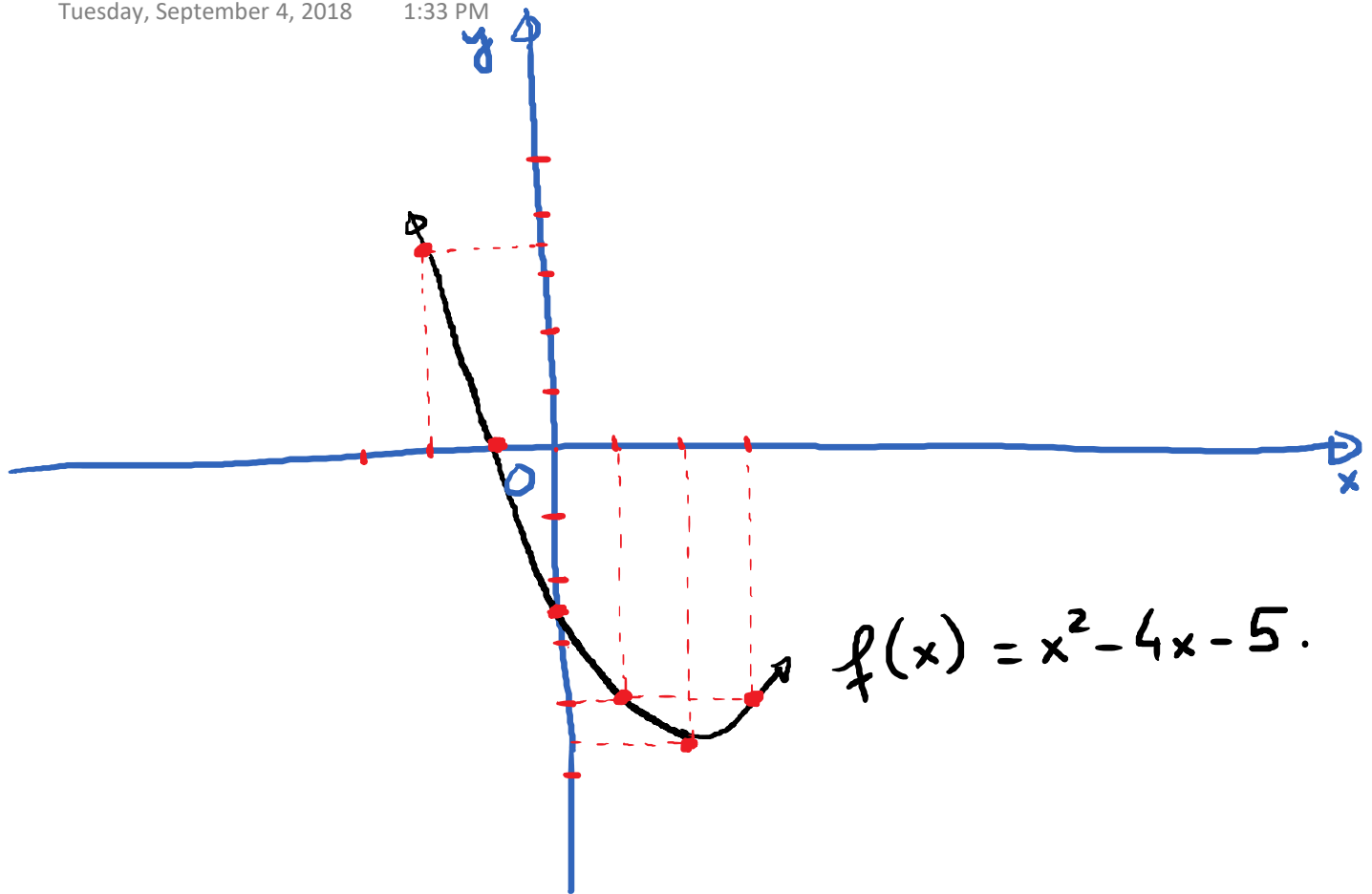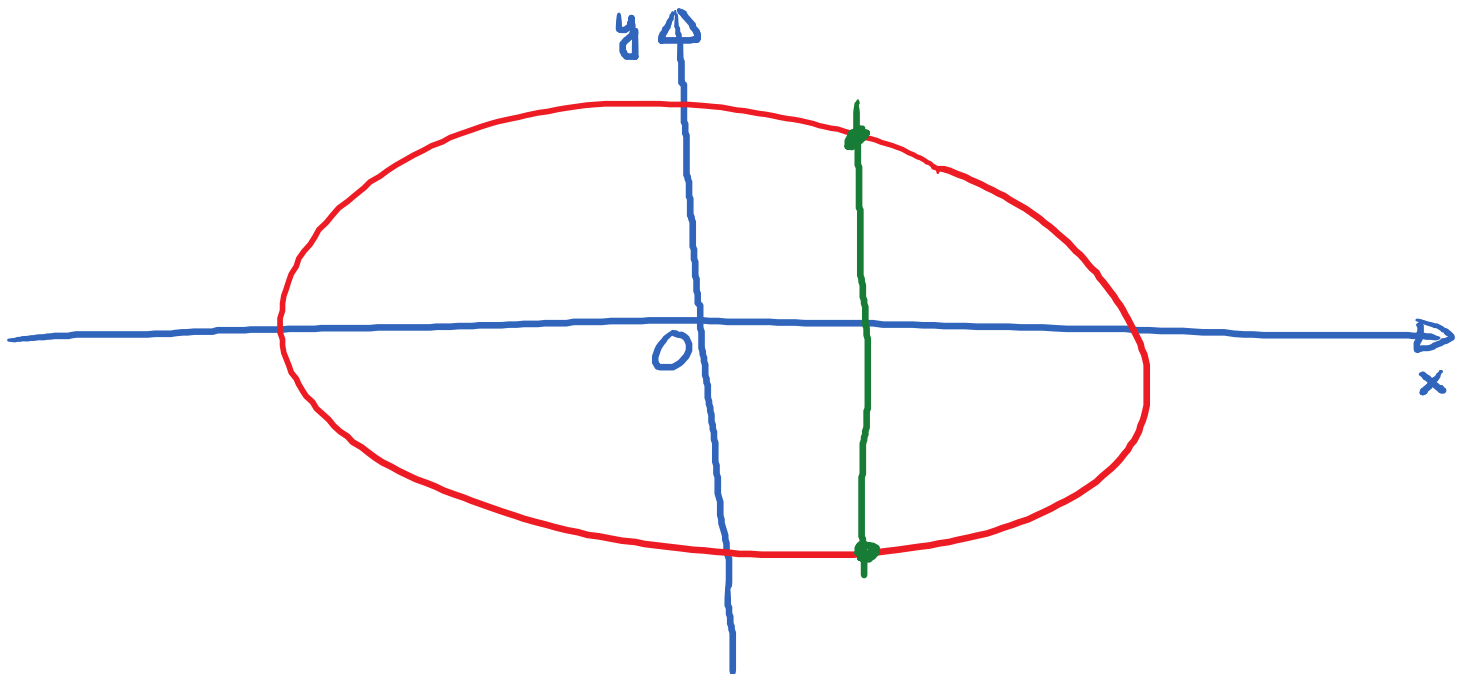
③ Graphs of Functions

To graph a function, we find the ordered pairs $(x, f(x))$, then we plot them, and sketch the graph through the points

E.g. Graph $f(x) = x^2 - 4x - 5$.

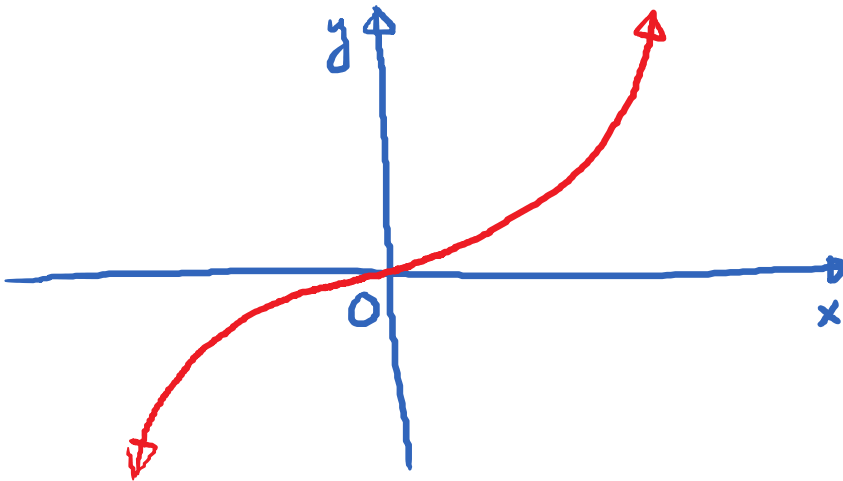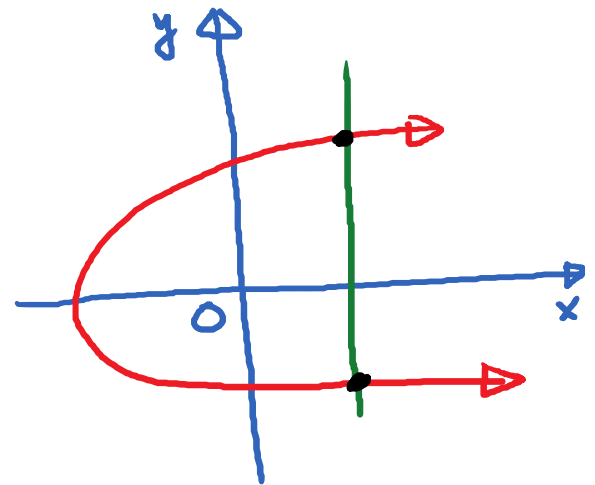| x	$f(x) = x^2 - 4x - 5$	
-2	7	$\longrightarrow (-2, 7)$
-1	0	$\longrightarrow (-1, 0)$
0	-5	$\longrightarrow (0, -5)$
1	-8	$\longrightarrow (1, -8)$
2	-9	$\longrightarrow (2, -9)$
3	-8	$\longrightarrow (3, -8)$

$$f(x) = x^2 - 4x - 5.$$

④ The Vertical - Line Test.
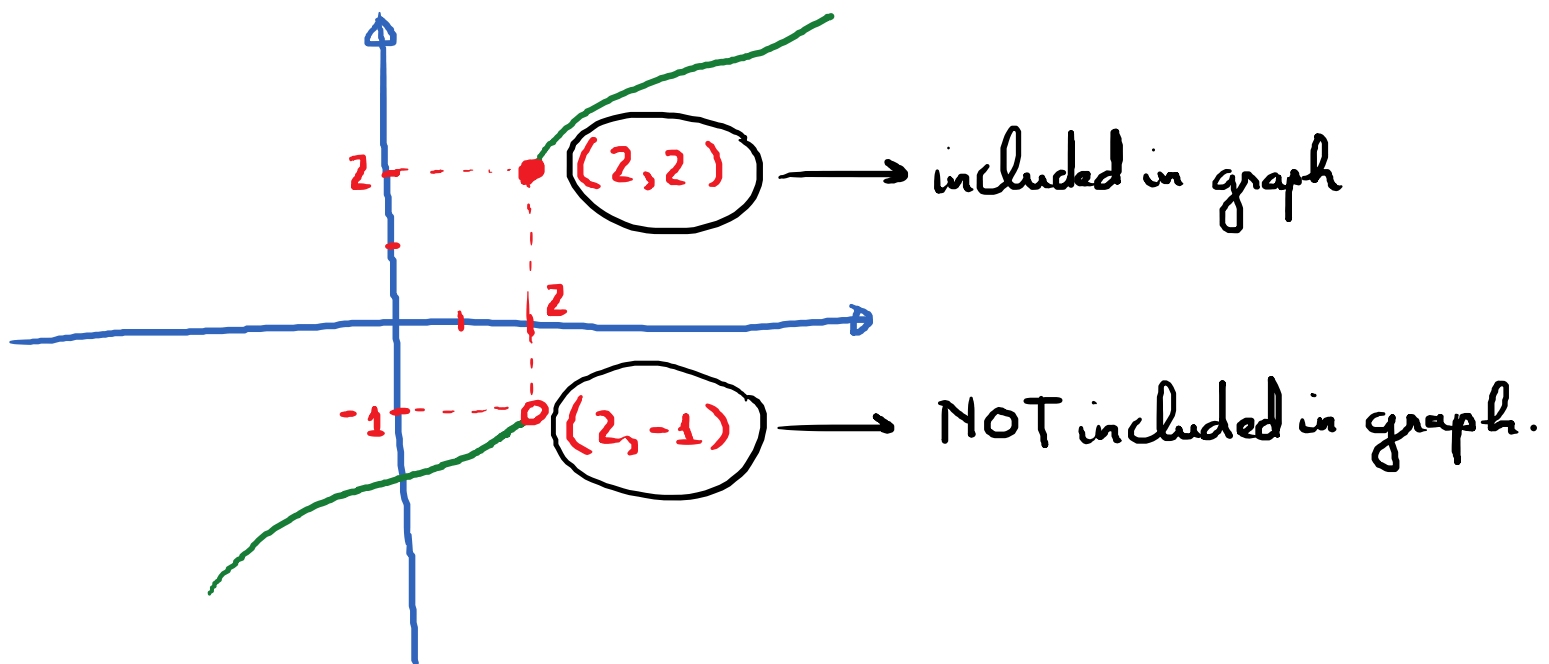
The Vertical - Line Test

If we can draw a vertical line which intersects a graph more than once, then the graph is NOT the graph of a function.

Graph of a Function

NOT graph of function.

2 ----------- ● (2, 2) ⟶ included in graph

2

-1 ---------- ○ (2, -1) ⟶ NOT included in graph.

Graph of a function