

1.1] Relations and Functions

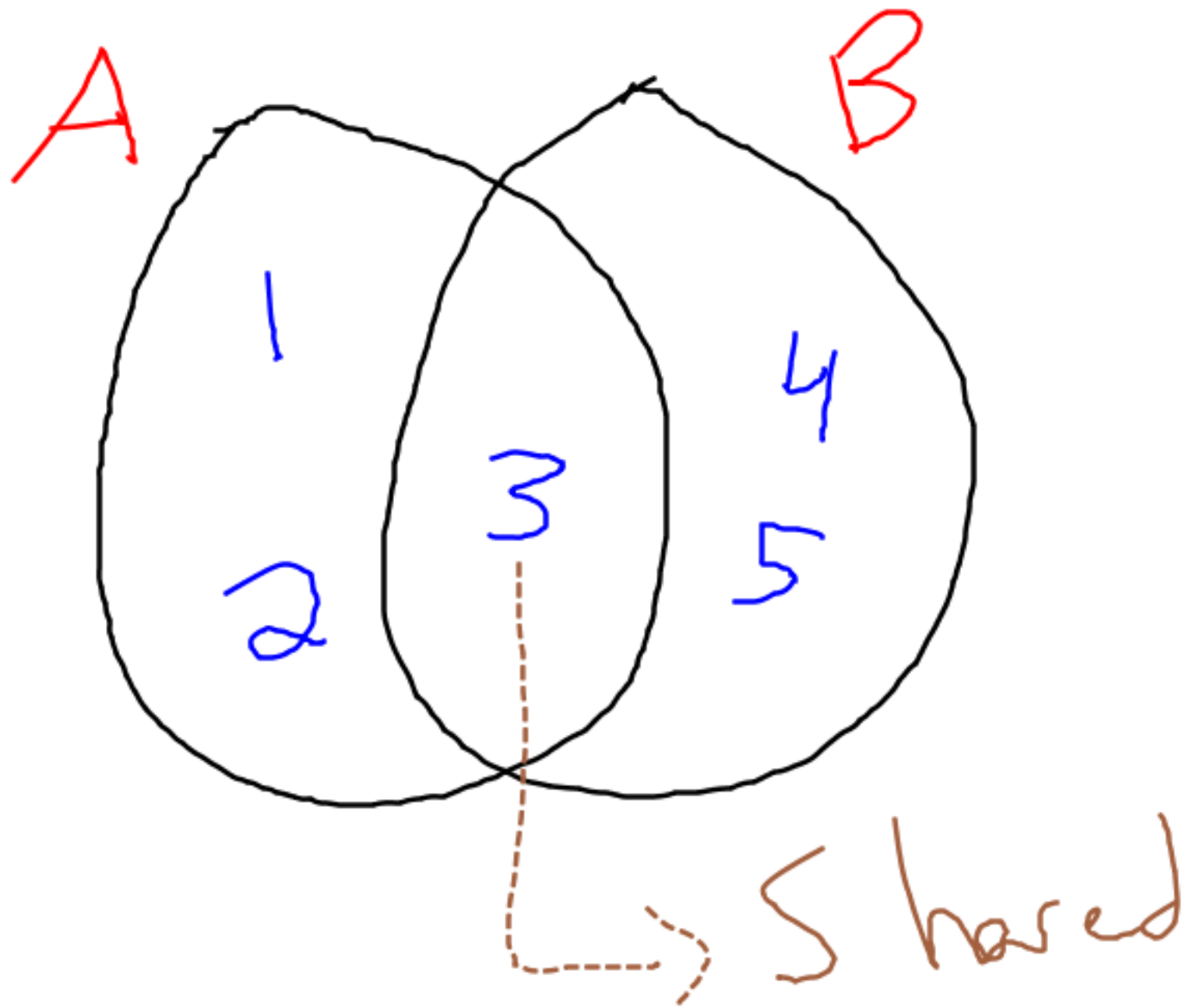
As mathematicians, we need to be able to speak and write as mathematicians. Therefore we need to learn some mathematical notation.

Sets: a collection of distinct objects

— this class: students

Mathematical Representations of sets:

1. Venn Diagram



Intersection
of A and B

$$A \cap B$$

↑

2. Table of Values

X	Y
1	2
2	6
3	10
4	14

ordered pair $(1, 2)$, $(2, 6)$

3. Relations

ex: $y = 2x + 3$

$$x^2 + y^2 = 9$$

$$d = st$$

$$E = mc^2$$

4. Set Notation

↳ uses $\{ \dots \}$

$\{ \text{Peter, Hannah, Elsa, Evan...} \}$

$\{ (0,1), (2,3), (6,18) \}$

Side note:

If $A = \{1, 2, 3, 4\}$ and

$B = \{3, 4\}$, then

B is called the subset of A

Special sets:

- Natural Numbers: $\mathbb{N} : \{1, 2, 3, \dots\}$

- Integers: $\mathbb{Z} : \{\dots, -2, -1, 0, 1, 2, \dots\}$

- Rational Numbers: $\mathbb{Q} : \{\text{all fractions}\}$

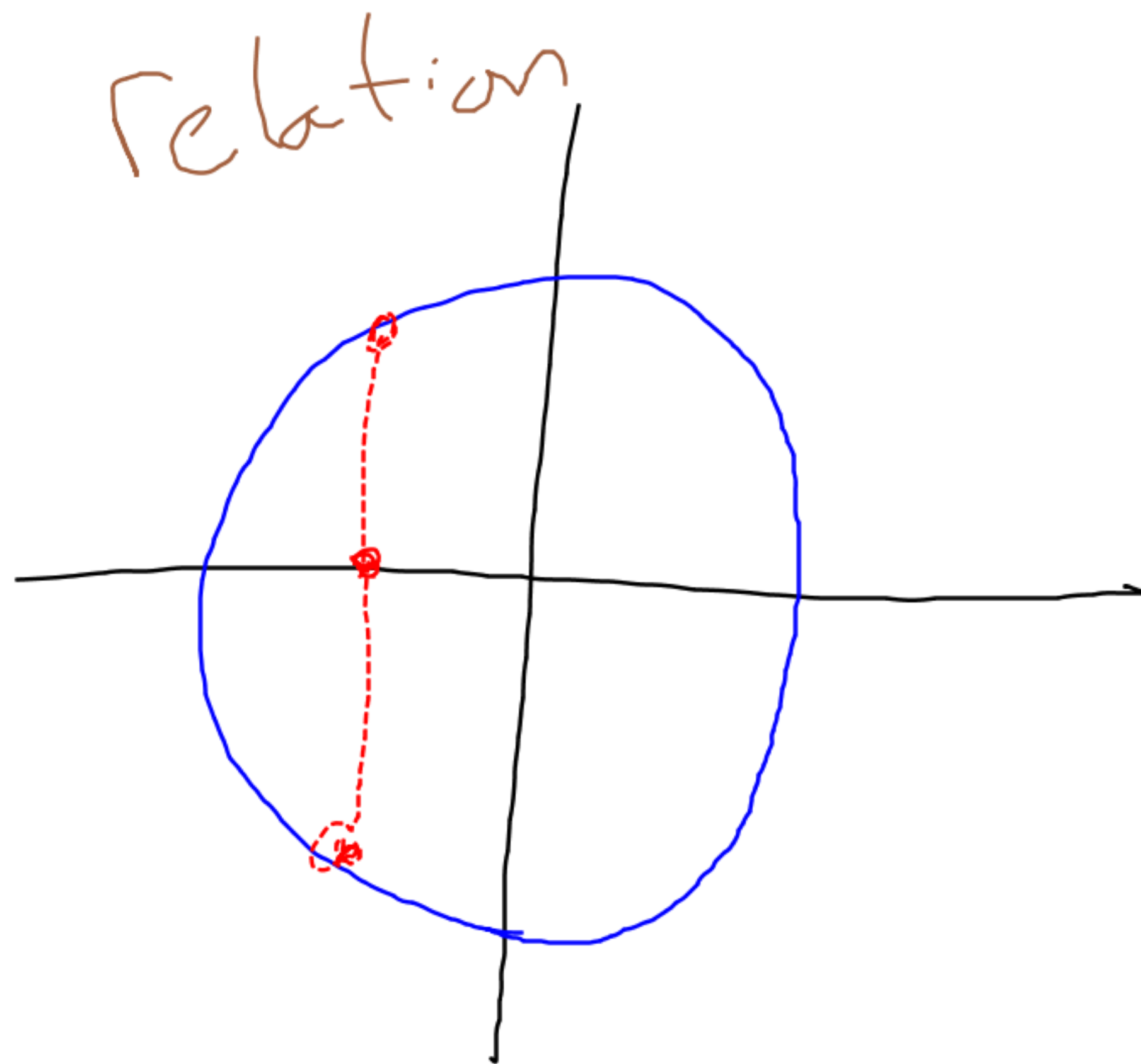
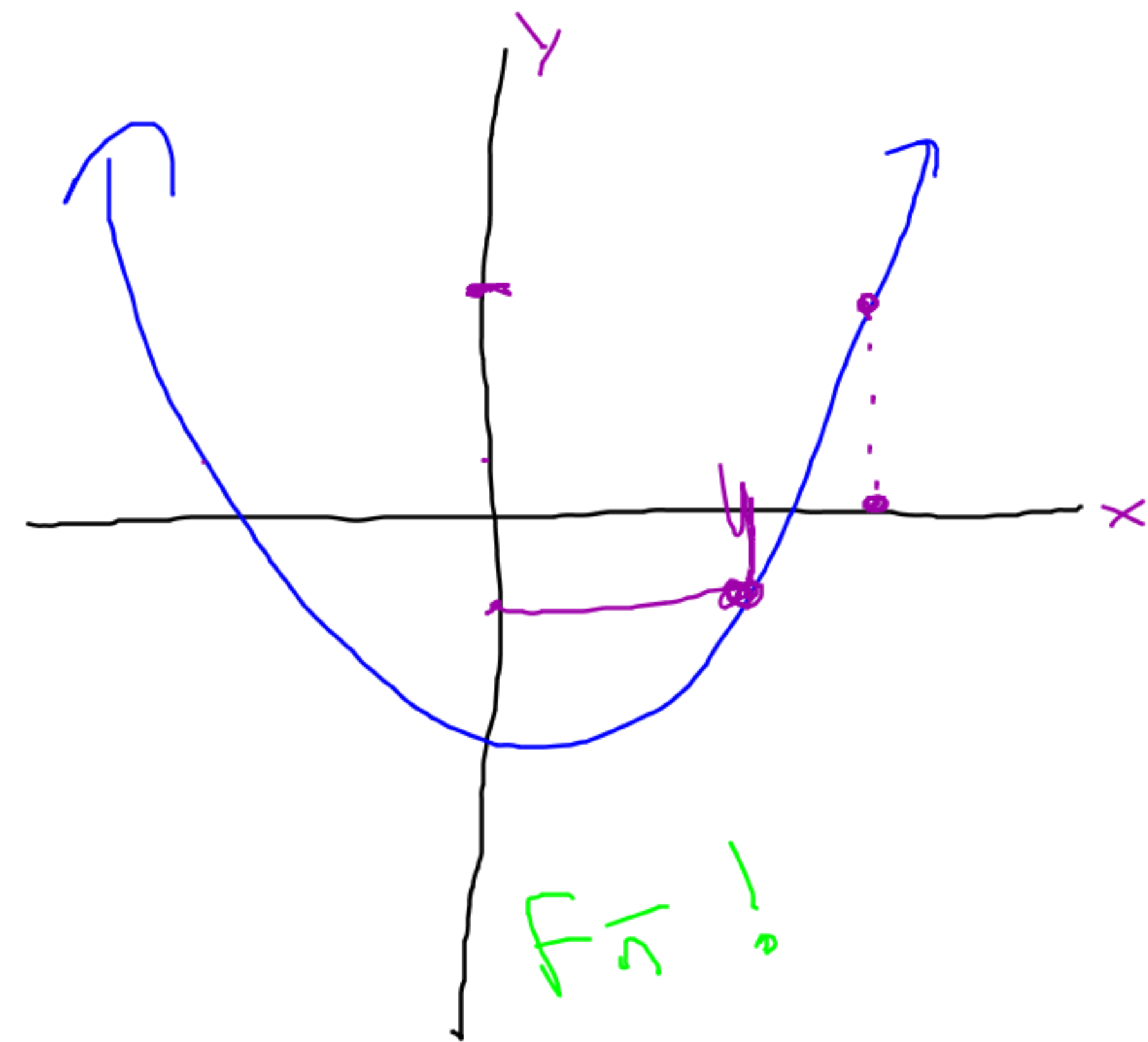
- Real Numbers: $\mathbb{R} : \{\text{all numbers}\}$

Function: A Function (F_n) is a subset of relations. F_n s are relation with

a 1 to 1 relationship. This means

that for every independent variable (x), there is only one dependent variable (y).

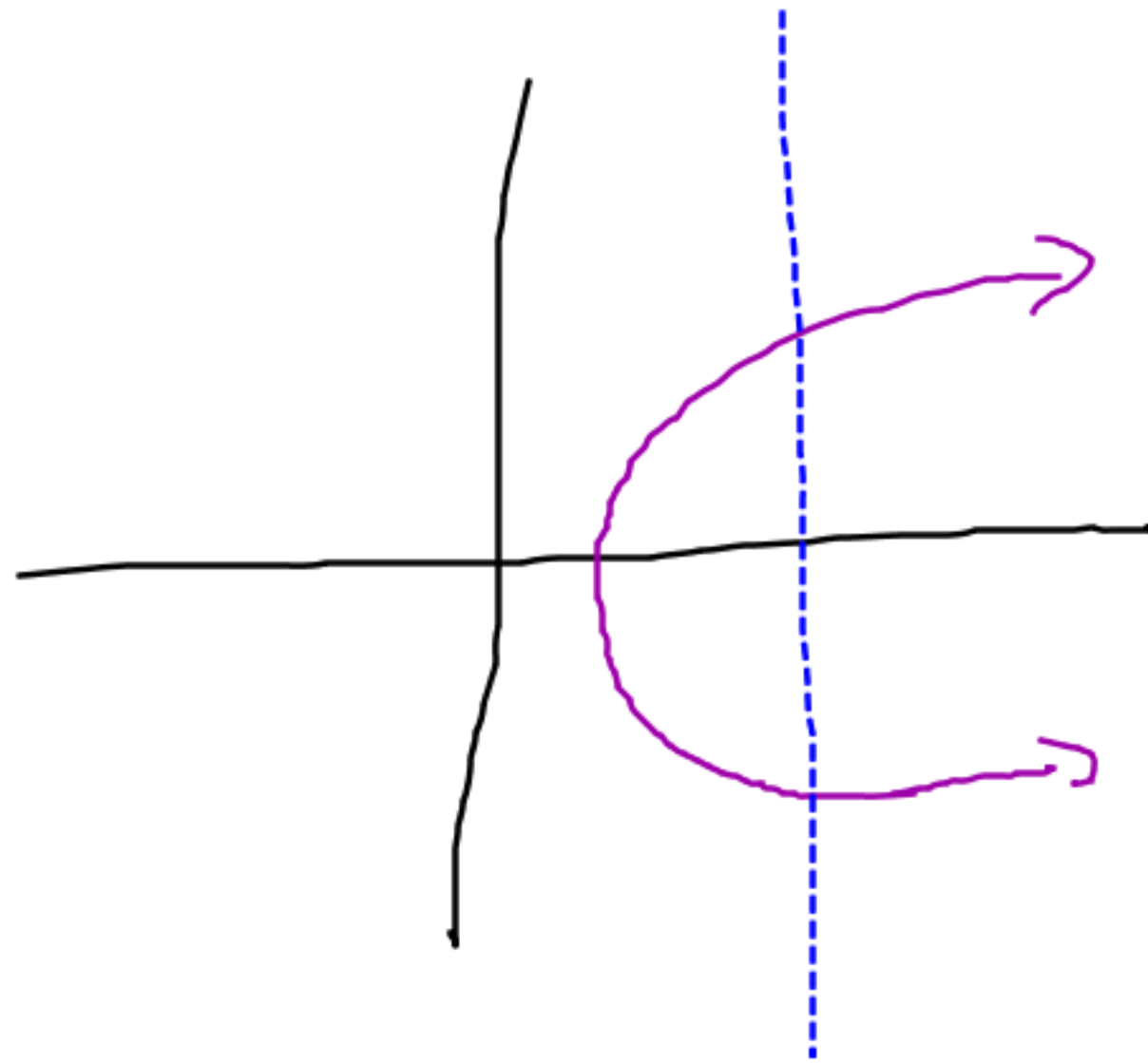
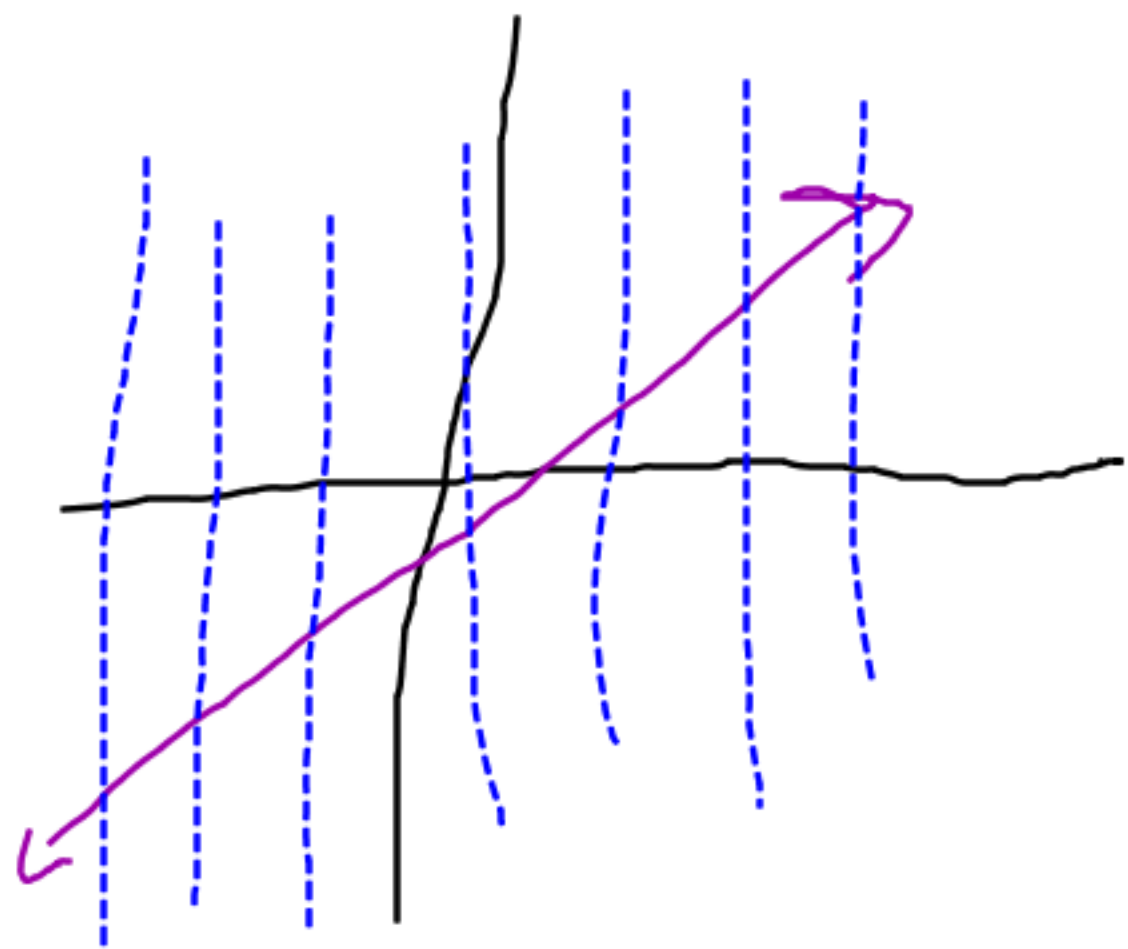
ex: $\{ (0, 1), (1, 2), (3, 0), (3, 4), (4, 2) \}$
relation

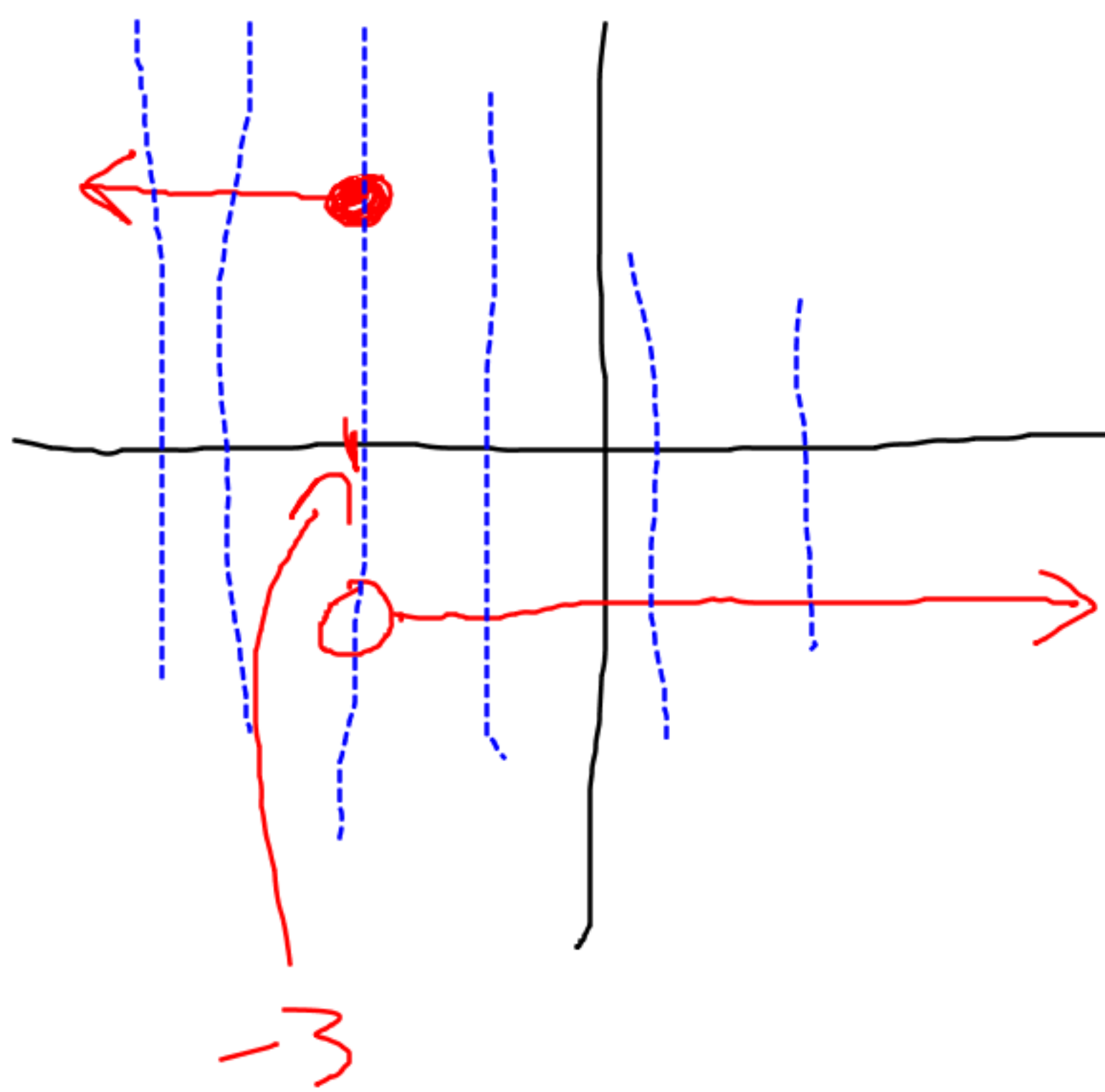


Vertical Line Test (VLT)

- draw vertical lines through the graph.

If a line touches the graph more than once, it is not a f_n





● - included

○ - not included

Domain: the set of
all possible x -values

Range: the set of
all possible y -values