

Lecture 1

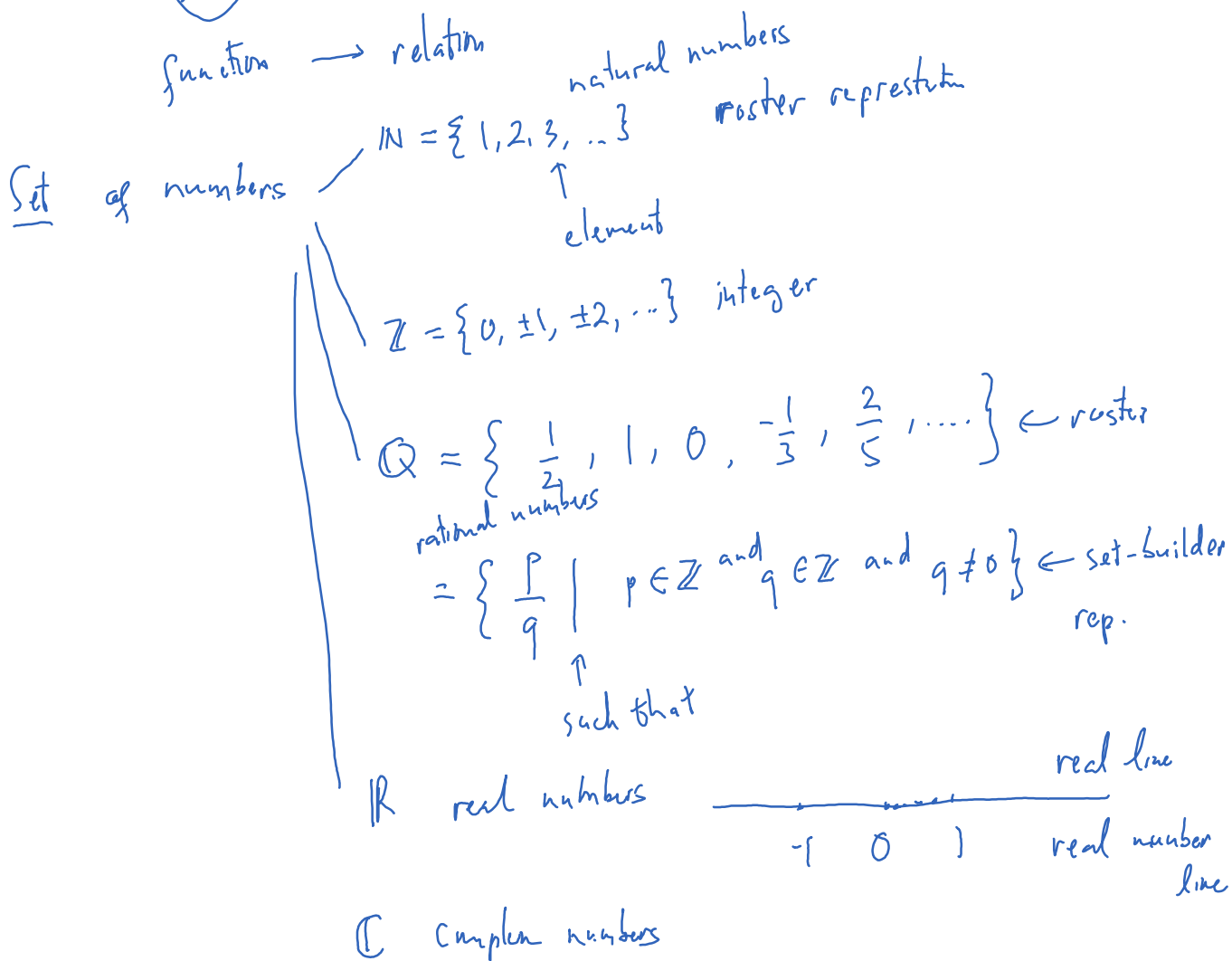
Wednesday, September 14, 2022 9:50 PM

Count objects

number \rightarrow quantity

(set) \rightarrow collection

function \rightarrow relation

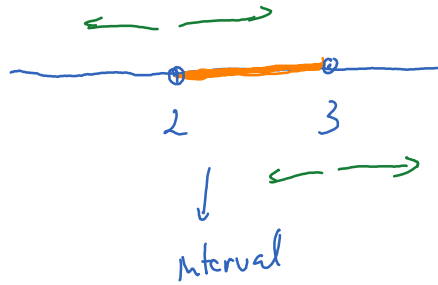


Set described
 / roster
 \ set-builder
 \ visual

$$\{x \mid 2 < x < 3\}$$

↑
such that

$$= (2, 3)$$



$$\{x \mid 2 \leq x < 3\}$$



$$= [2, 3)$$

↑ included ↖ not included

$$\{x \mid -1 \leq x \leq 1\}$$



$$\underline{[-1, 1]}$$

interval notation

Union : A, B $A \cup B = \{x \mid x \in A \text{ or } B\}$

$$[0, 1] \cup [2, 3)$$



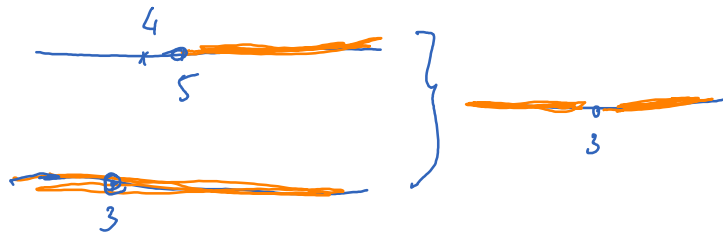
Intersection A, B $A \cap B = \{x \mid x \in A \text{ and } B\}$

$$[0, 1] \cap [2, 3) = \emptyset$$

Ex $\{x \mid x > 5 \text{ or } x \neq 3\} \approx A \cup B = \{x \mid x \neq 3\} = B$

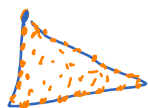
$A = \{x \mid x > 5\}$

$B = \{x \mid x \neq 3\}$

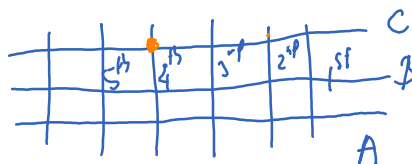


Real line

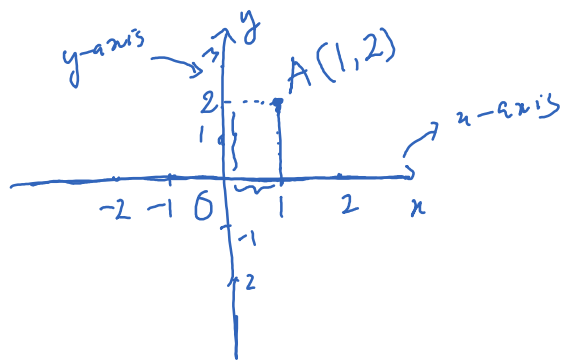
Set of points



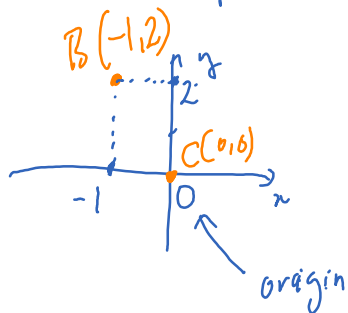
points \leftrightarrow 2 numbers called coordinates.



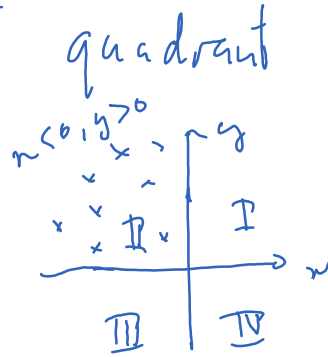
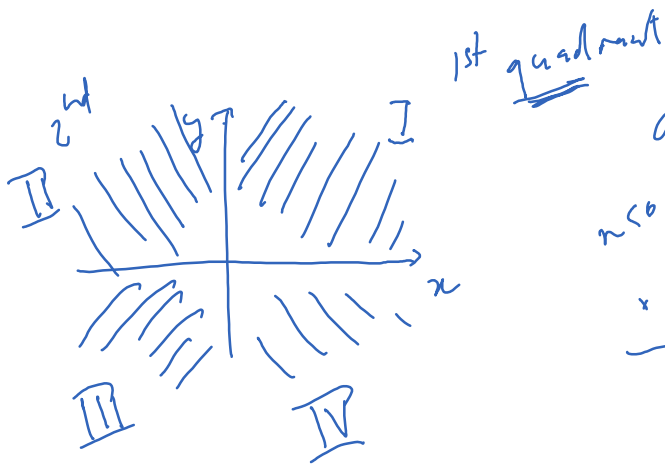
Cartesian coord system:



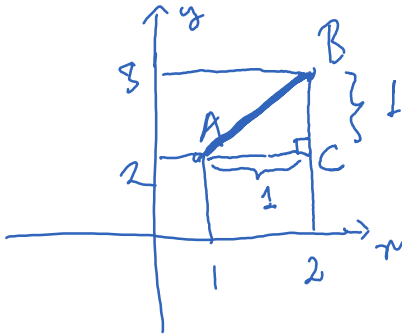
$B(-1,2)$
 \downarrow
 y-coord
 x-coord



$C(0,0)$



G



Pythagorean thm:

$$AB^2 = AC^2 + BC^2 = 1^2 + 1^2 = 2$$

$$AB = \sqrt{2} \approx 1.4142\dots$$

$$A(a, b)$$

$$B(c, d)$$

$$AB = \sqrt{(a-c)^2 + (b-d)^2}$$