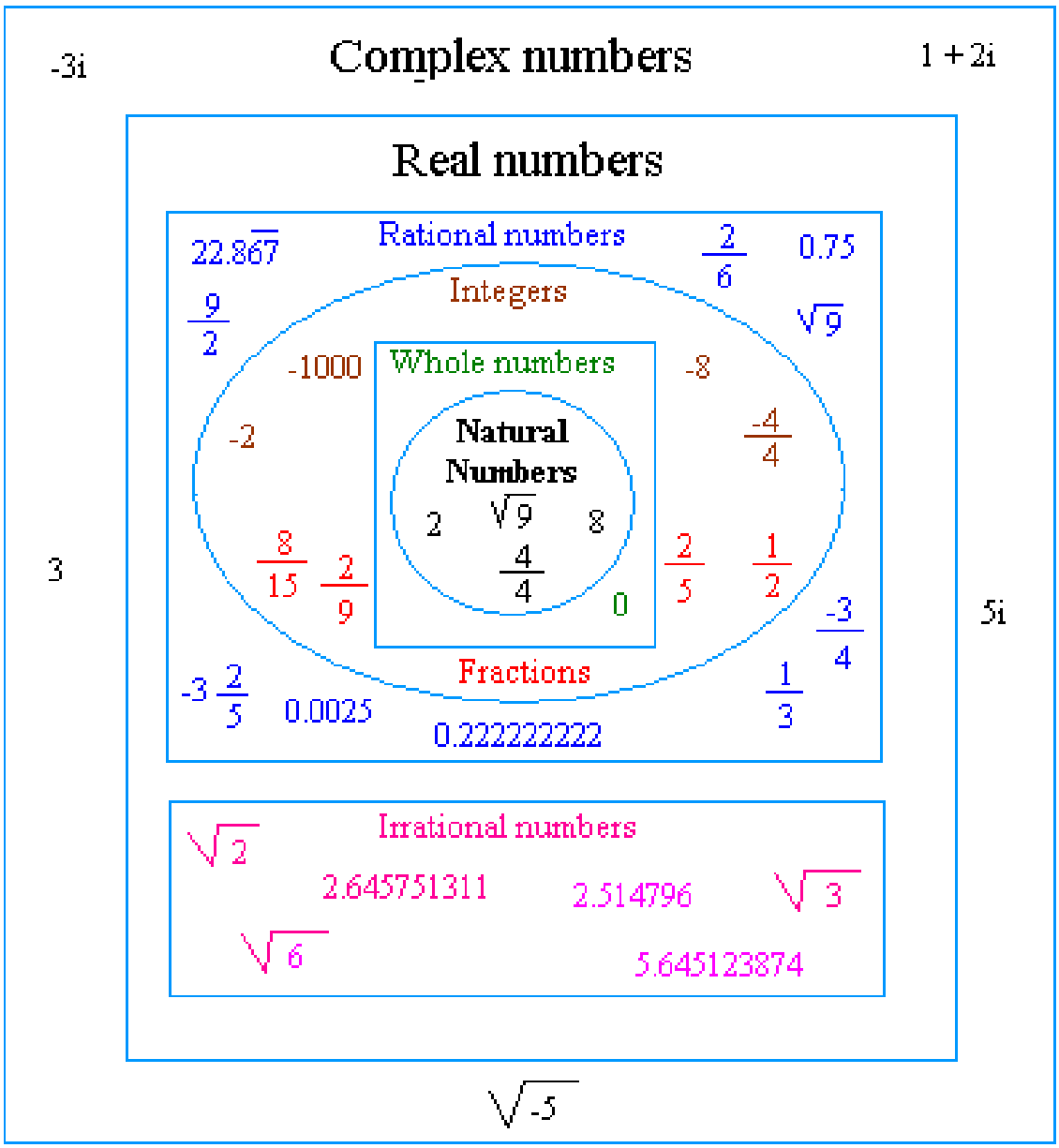
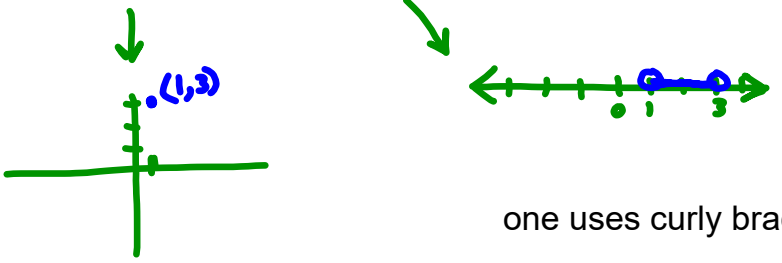

Complex numbers
-3i
1 + 2i
3
5i
$\sqrt{-5}$
Real numbers
Rational numbers
Integers
Whole numbers
Natural Numbers
Fractions
Irrational numbers
$22.8\overline{67}$
$\frac{9}{2}$
-1000
-2
$\frac{8}{15}$
$\frac{2}{9}$
$-3\frac{2}{5}$
0.0025
0.222222222
$\frac{2}{6}$
0.75
$\sqrt{9}$
-8
$\frac{-4}{4}$
2
$\sqrt{9}$
8
$\frac{4}{4}$
0
$\frac{2}{5}$
$\frac{1}{2}$
$\frac{-3}{4}$
$\frac{1}{3}$
$\sqrt{2}$
2.645751311
2.514796
$\sqrt{3}$
$\sqrt{6}$
5.645123874

Section R. 1 (p. 7)

$\in$ epsilon

$\in$ belongs to

When is $(1,3) \neq (1,3)$?



one uses curly braces when listing a finite many.

Recall,

[1,3] is a **closed interval**. It contains {1, 1.01, 1.7, 2.99, 3}

$\{x : 1 \leq x \leq 3\}$ (include, include)

(1,3) is an **open interval**. It contains {1.01, 1.7, 2.99}

$\{x : 1 < x < 3\}$ (exclude, exclude)

[1,3) is a **half-open interval**. It contains {1, 1.01, 1.7, 2.99}

$\{x : 1 \leq x < 3\}$ (include, exclude)

Unbounded Intervals

$x > 3 \quad (3, \infty)$

$x < 3 \quad (-\infty, 3)$

$x \geq 3 \quad [3, \infty)$

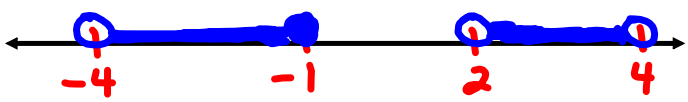
$x \leq 3 \quad (-\infty, 3]$

all real numbers $(-\infty, \infty) = \mathbb{R}$

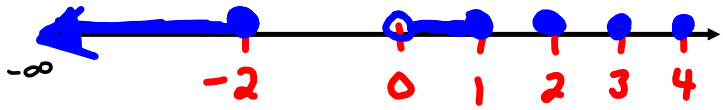
Advanced Interval Notation

$\cup$ = "or"
union

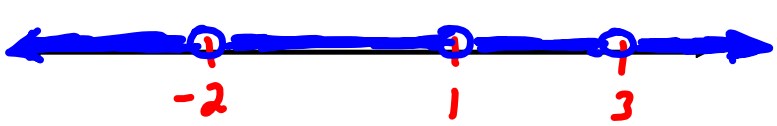
Write the following in interval notation

1. 

$x \in (-4, -1] \cup (2, 4)$.

2. 

$x \in (-\infty, -2] \cup (0, 1] \cup \{2, 3, 4\}$

3. 

$x \in \mathbb{R} \sim \{-2, 1, 3\}$

$x \in (-\infty, -2) \cup (-2, 1) \cup (1, 3) \cup (3, \infty)$

Write interval notation. Then graph the interval.

1. $\{x|-2 < x < 2\}$ $x \in (-2, 2)$

2. $\{x|4 \leq x < 6\}$ $x \in [4, 6)$

3. $\{x|x \geq \sqrt{3}\}$ $x \in [\sqrt{3}, \infty)$

4. $\{x|-3 > x\}$ = $\{x: x < -3\}$ $x \in (-\infty, -3)$

1.2 Relations/Functions

Definition: A relation is a set of ordered pairs. The domain (inputs) is the set of x-coordinates. The range (outputs) is the set of y-coordinates.

Ex. $R=\{(2,1),(3,6),(-4,6),(2,-3)\}$

Domain: $x \in \{2,3,-4\} = \{-4,2,3\}$

Range: $y \in \{1,6,-3\}$

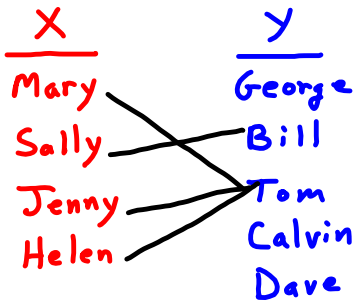
Definition: A function is a relation in which the x-coordinates do not repeat.

Is set R a function? No, the 2 repeated

Is set $f: \{(1,4),(-2,5),(6,4),(7,4)\}$ a function? Yes

Function = Old Fashion Mormon Concept of Marriage

Chromosomes

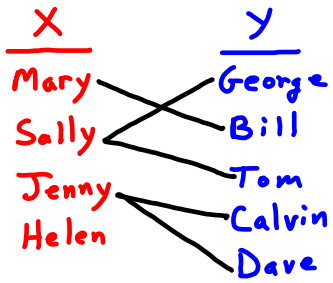


$\{(M,T),(S,B),(J,T),(H,T)\}$

This relation is a functions

Domain: $\{M,S,J,H\}$

Range: $\{B,T\}$



Is this a function?

$\{(M,B),(S,G),(S,T),(J,C),(J,D)\}$

Not a function

Domain: $\{M,S,J\}$

Range: $\{G,B,T,C,D\}$

Input

Domain: US citizen

(Rule) Correspondence: Get a SSN

Range: Set of SSN Numbers

Function Yes or No

Domain: FDTC student

(Rule) Correspondence: Class student is enrolled in

Range: Set of Classes

Function Yes or No

(Judy, Mat 110)
(Judy, Eng 101)

Domain: A number

(Rule) Correspondence: Multiply it by 3

Range: Set of Numbers

Function Yes or No

Domain: A number

(Rule) Correspondence: Find a square root

Range: Set of Numbers

Function Yes or No

$(9, -3)$ $(-3)^2 = 9$

$(9, 3)$ $3^2 = 9$

Domain: A number

(Rule) Correspondence: Find the principal $\sqrt{}$ square root

Range: Set of Numbers

$(9, \sqrt{9}) = (9, 3)$

Function Yes or No