

Mac Vallejo

TR 9:30 - 4:00

Me Fri 10-10:50

Office Hours 9-10 MWF
11-12 TR

Read Page 2 - "Study Skills"

1.1 Notation and Symbols

④ Juan bought a bicycle and paid
\$100 for it.

it = bicycle

Sam threw the ball and it hit
his dog.

it = ball

ly

$$x = 6 + 3$$

$$x = 9$$

$$x = 32 - 4$$

$$x = 28$$

Most common variables

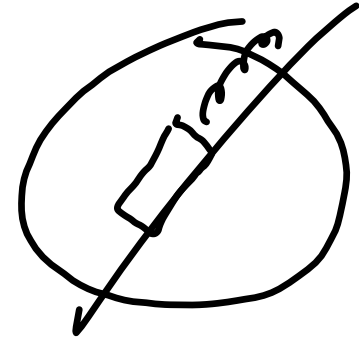
x, y, z, a, b, c

z z $\leftarrow$ cross z
 z
 z

Comparison symbols

$a = b$ "a is equal to b"

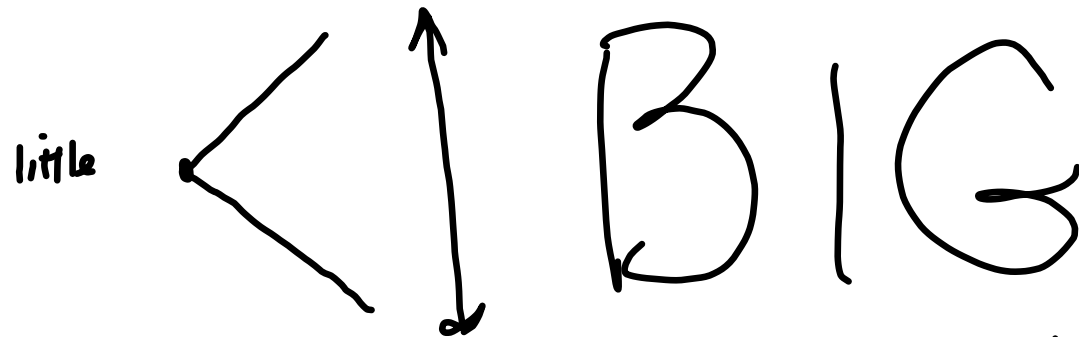
$a \neq b$



a slash across a
mathematical symbol means
not — i.e. negates it

* $a < b$ "a is less than b"

$a > b$ "a is greater than b"



$a \neq b$

$a = b$

or $a > b$

$a \geq b$

"a is greater than or equal to b"

$a \leq b$

"a is less than or equal to b"

Operations

$a + b$ the sum of a & b

Addition

$a - b$ subtraction the difference of a and b .

Subtraction

Multiplication $a \cdot b$, $a(b)$

$(a)b$, ab

The product of a and b

Division

$a \div b$, $\frac{a}{b}$

$3 \cdot 2$, $(3)(2)$

$\frac{1}{2} \times$

$b \overline{)a}$

$\frac{1}{2} \times = \frac{1}{2} \times$

The quotient of a & b

on top

on bottom

The quotient of x and z

$$\frac{x}{z}$$

Grouping Symbols

 $() , []$ ——— fraction bar.
 $| |$ absolute value

$\{ \}$ are used for set notation

equation - a mathematical sentence

Ⓔ The sum of 6 and 2 is 8

$$6 + 2 = 8$$

verb

↓
Twice the sum of 6 and 2 is greater
than 10.

$$2(6 + 2) > 10 \quad \leftarrow \text{translated}$$

The product of 5 and y is greater than
or equal to the difference of y and 16.

$$5y \geq y - 16$$

Exponential notation

$2^3 \rightarrow$ exponent
 $\downarrow$
base

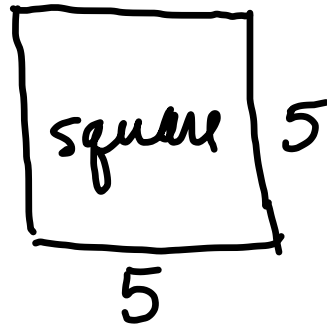
$$2^3 = 2 \cdot 2 \cdot 2 = 8$$

$$3^2 = 3 \cdot 3 = 9$$

5 can be written 5^1

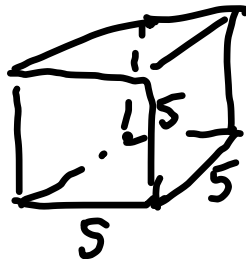
5^2 5 to the 2nd power

5 squared



5^2

5^3



$$5 \cdot 5 \cdot 5 = 5^3$$

5 cubed

Order that we do things is important

ex $3 + 2 \cdot 5$

$$5 \cdot 5$$

$$25$$

NOT

$$3 + 2 \cdot 5$$

$$3 + 10$$

$$13$$

✓ correct

When we have grouping symbols
start within the innermost
grouping symbol & work
outward $()$, $[\]$, --- , $|$ $|$

ORDER

① Simplify all exponents
first

② Do Multiplication and Division
from left to right

③ Do Addition / Subtract from
 $l \rightarrow r$

② $6 \cdot 10^2 + 5 \cdot 10 + 4$
 $6 \cdot 100 + 5 \cdot 10 + 4$
 $600 + 50 + 4$
 $650 + 4$
 654

② $3(4 \cdot 5 - 12) + 6(7 \cdot 6 - 40)$
 $3(20 - 12) + 6(42 - 40)$
 $3(8) + 6(2)$
 $24 + 12$
 36

Number Sequences and Inductive Reasoning

(ex) 1, 5, 9, 13, 17, ...
 \ / \ / \ /
 +4 +4 +4 ellipses

21

Arithmetic Sequence

The Fibonacci Sequence

1, 1, 2, 3, 5, 8, ...
 ↑

next 13, 21, 34

How about

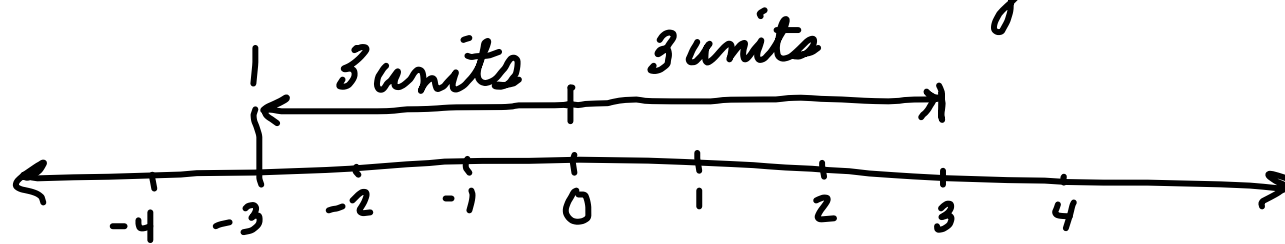
2, 6, 18, 54, ...

\ * 3 / \ * 3 / \ * 3 /

next 162

A geometric sequence

Absolute Value - distance from zero



Real # line

Absolute Value

$$|3| = 3$$

$$|-3| = 3$$

$$|0| = 0$$

$$|2.3 - 6|$$

$$|6 - 6|$$

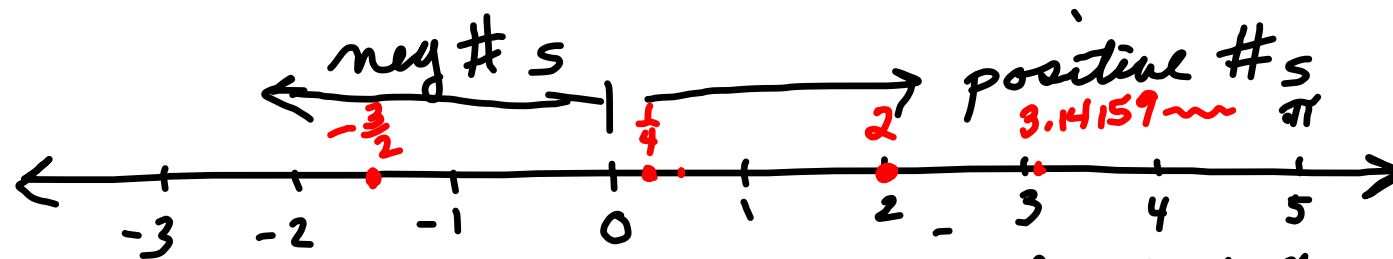
$$|0| = 0$$

$$|-10| = 10$$

$$|x| \geq 0$$

1.2

Real Numbers

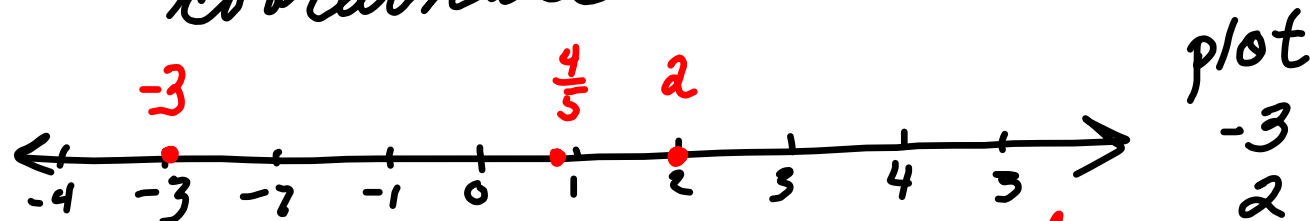


increasing
decreasing

20° below zero
 -20°

The number associated with a point is called the coordinate.

coordinate

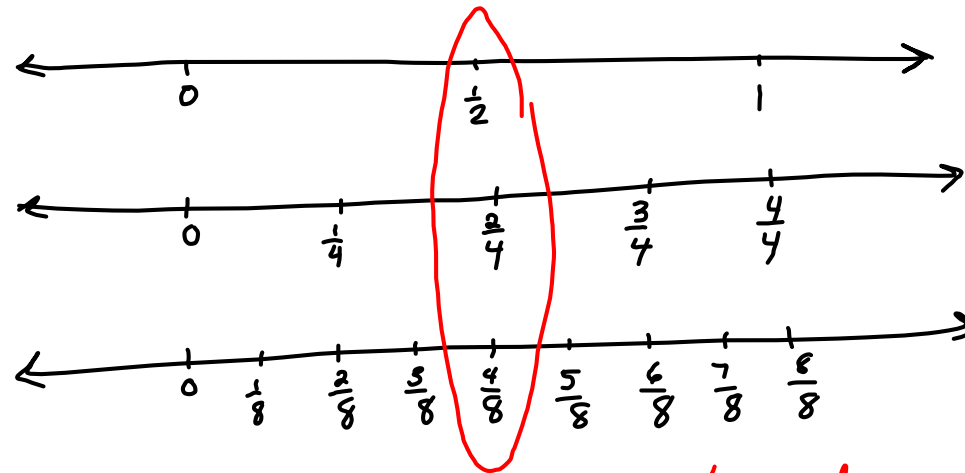


label points when you plot them.

Every number that can be represented
by a point on the Real Number
line is a Real Number

A number $\frac{a}{b}$ where a & b are real
and $b \neq 0$

$\frac{a}{b}$ - numerator
 b - denominator
(cannot be zero)



$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$$

equivalent fractions

$$\frac{1}{3} \cdot \frac{2}{2} = \frac{1 \cdot 2}{3 \cdot 2} = \frac{2}{6}$$

$$\frac{2 \div 2}{6 \div 2} = \frac{1}{3}$$

$$\frac{4}{1} = 4$$

$$\frac{4}{1} \left(\frac{2}{2} \right) = \frac{8}{2}$$

$$\frac{1}{2} = \frac{4}{8} = \frac{8}{16}$$

are all equivalent