Name: _____ Date: _____

Learning Goal 3.1	I can identify, compare, and order rational numbers.

Natural Numbers ( ) ℕ

Counting numbers - start at 1, 2, 3, ...
- ∞
- no decimals or fractions.

Whole Numbers ( ) 𝕎

counting numbers + 0

0, 1, 2, 3, ... to infinity
- still no decimals or fractions

Positive Numbers

bigger than the others.

⇔ natural numbers
↑ the same as.

- also includes decimals and fractions.

Negative Numbers

- not positive
- not ~~zero~~

Integers ( ) ~~ℤ~~ ℤ

- all positive and negative whole numbers
- no fractions
- no decimals

Rational Numbers (Q)

Any number that can be written as a fraction.

ex $\frac{6}{1}$ $0.735 = \frac{735}{1000}$ $0.\overline{3} = \frac{1}{3}$

- Proper Fractions

  numerator is smaller than the denominator. (top / bottom) $\frac{4 \div 2}{6 \div 2} = \frac{2}{3}$

- Improper Fractions

  numerator is bigger than the denominator. $\frac{6 \div 2}{4 \div 2} = \frac{3}{2}$

- Mixed Numbers

  a whole number and a proper fraction $1\frac{2 \div 2}{4 \div 2} = 1\frac{1}{2}$

Examples of Rational Numbers ( ):

- 2 can be expressed in the form $\frac{a}{b}$ as $\frac{2}{1} = \frac{4}{2} = \frac{8}{4} = \frac{100}{50}$
- $-\frac{13}{9}$ = not reducable $= 1.\overline{4}$
- $\frac{\sqrt{16}}{3}$ = $\frac{4}{3}$ ∴ $1\frac{1}{3}$

  $\sqrt{16} = \sqrt{4 \times 4} = 4$
- $\sqrt{4}$ = 2 or $2\frac{1}{2}$ = ~~_____~~ or $\frac{1}{4}$ = ~~_____~~ ∴ ~~since all _____ all are _____~~
- $\frac{2}{3} = 0.66666\ldots$ ∴ repeating decimal (repeats) ($0.\overline{6}$ = rational.)
- $\frac{5}{11} = 0.454545\ldots$ ∴ " (repeats) ($0.\overline{45}$ = rational.)

All decimals that repeat or terminate (stop) are rational.

$\frac{4}{3} = 1\frac{1}{3}$ (+ ~ ×)

$= \frac{3+1}{3} = \frac{3}{3} + \frac{1}{3} = 1 + \frac{1}{3}$

$0.4555555\ldots \neq 0.\overline{45} = 0.4\overline{5}$

Assignment p.100 #1-13, 17, 21, 25 Quiz: Next Day!

Irrational Numbers

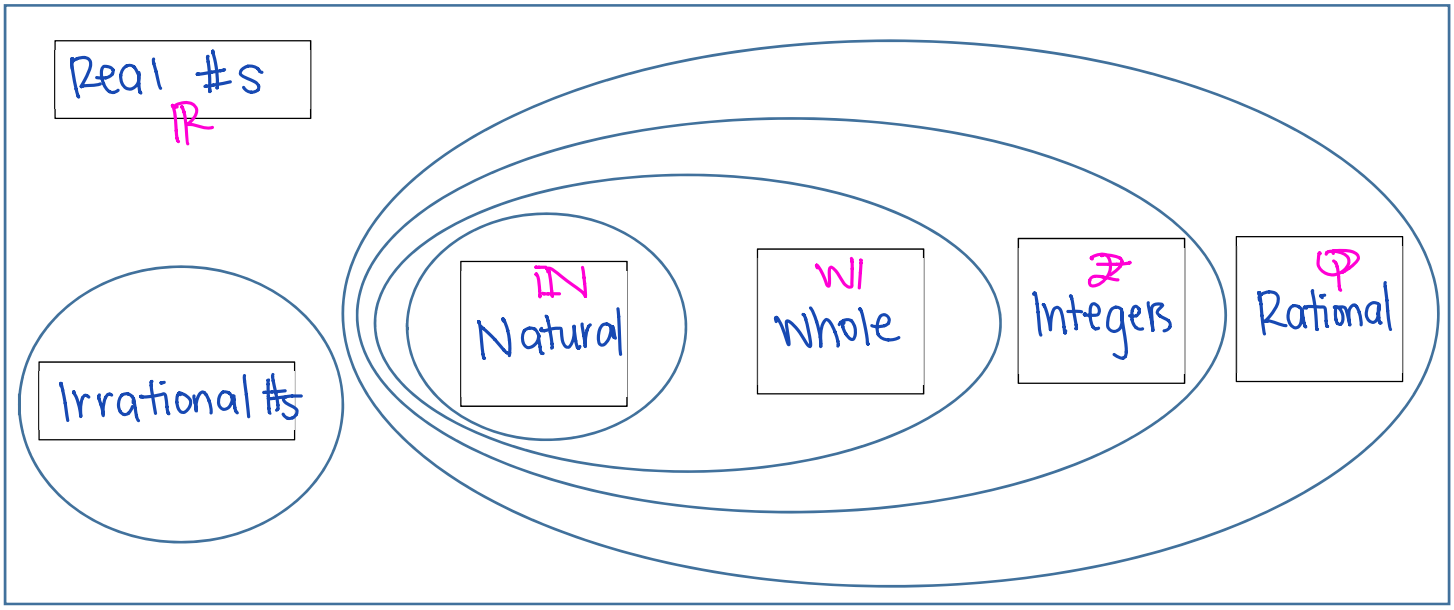
- any number that is not a rational number
- cannot be written as a fraction.
- non-repeating, non-terminating decimals.

Examples of irrational numbers:

- $\sqrt{2} = 1.41421356\ldots$ ∴ Irrational (never terminate or repeats)
- $\pi = 3.14159265\ldots$ ∴ Irrational (never " or ")
- 1.23223222322223222223… Even though it has a pattern, it does not repeat or terminate and therefore it is irrational

Real Numbers ( ) ℝ

- all the sets combined


Real #s
ℝ
Irrational #s
ℕ
Natural
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Whole
ℤ
Integers
ℚ
Rational