

January 9, 2015

$N = \{1, 2, \dots\}$

$m = m \cdot k$

$x - 2 = 0$
 $x = 2 \rightarrow N$

$x + 2 = 2$
 $x = 0 \rightarrow \checkmark$

Natural Numbers

- ① Prime: $\{2, 3, 5, 7, 11, 13, \dots\}$
- ② Composite

* The Fundamental Thm. of Arithmetic

* All Natural numbers can be written as a Product of Primes

$11 = 11 \cdot 1$

$24 \rightarrow$ Composite

① $12 \rightarrow$ Composite

② $4 \rightarrow$ Composite

③ 3

$24 = 2 \cdot 2 \cdot 2 \cdot 3 = 2^3 \cdot 3$

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② Whole Numbers

$x + 5 = 5$
 $x = 0$

$W = \{0, 1, 2, \dots\}$

$x + 3 = 0$
 $x = -3$

Integers

$I = \{\dots, -2, -1, 0, 1, 2, \dots\}$

** opposite*

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$2x - 1 = 0$
 $\frac{2x}{2} = \frac{1}{2}$
 $x = \frac{1}{2}$ fraction

Rational Numbers
 (Ratio)
 (Fraction)

$Q = \left\{ \frac{m}{n} \mid \begin{array}{l} m \text{ \& n are} \\ \text{integers \&} \\ \text{such that} \\ n \neq 0 \end{array} \right\}$

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Why can "n" not be zero?

$\frac{m}{n}; n \neq 0?$

$\frac{5}{0} \rightarrow n = mk$
 $\frac{5}{0} = \frac{m}{1} \cdot k$

Undefined!

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$\frac{5}{1}, -\frac{23}{1}$

Rational

$\frac{1}{2}, \frac{3}{4}, -\frac{10}{10}$
 $.5, .75$
 $\frac{2}{3} = .6\bar{6}$

Integers $\{\dots, -2, -1, 0, 1, 2, \dots\}$

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$x^2 - 2 = 0$
 $\sqrt{x^2} = 2$
 $x = \pm\sqrt{2}$

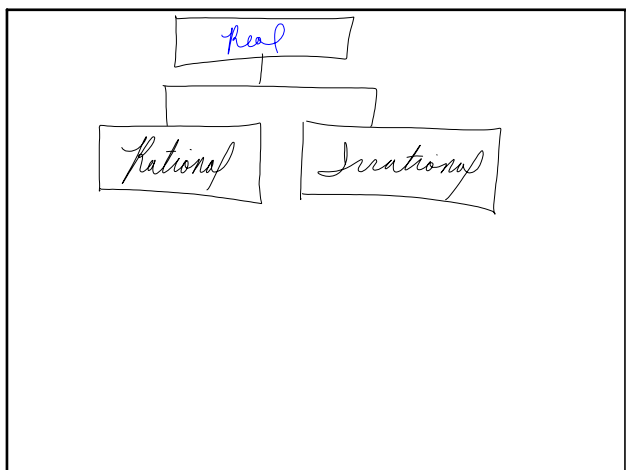
* what is $\sqrt{2}$?

Irrational Numbers

{ all numbers that are not Rational }

$\sqrt{2}, \sqrt{3}, \sqrt{5}, \pi, e$
 \downarrow
 3.14

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Terminating Fractions

$$\frac{1}{2} = 2 \overline{) 1.0}$$

$$\begin{array}{r} 0.5 \\ 2 \overline{) 1.0} \\ \underline{-1 \ 0} \\ 0 \end{array}$$

NON-Terminating

$$\frac{2}{3} = 3 \overline{) 2.000}$$

$$\begin{array}{r} 0.666 \\ 3 \overline{) 2.000} \\ \underline{-1 \ 8} \\ 2 \\ \underline{-1 \ 8} \\ 0 \\ \underline{-0 \ 0} \\ 0 \end{array}$$

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