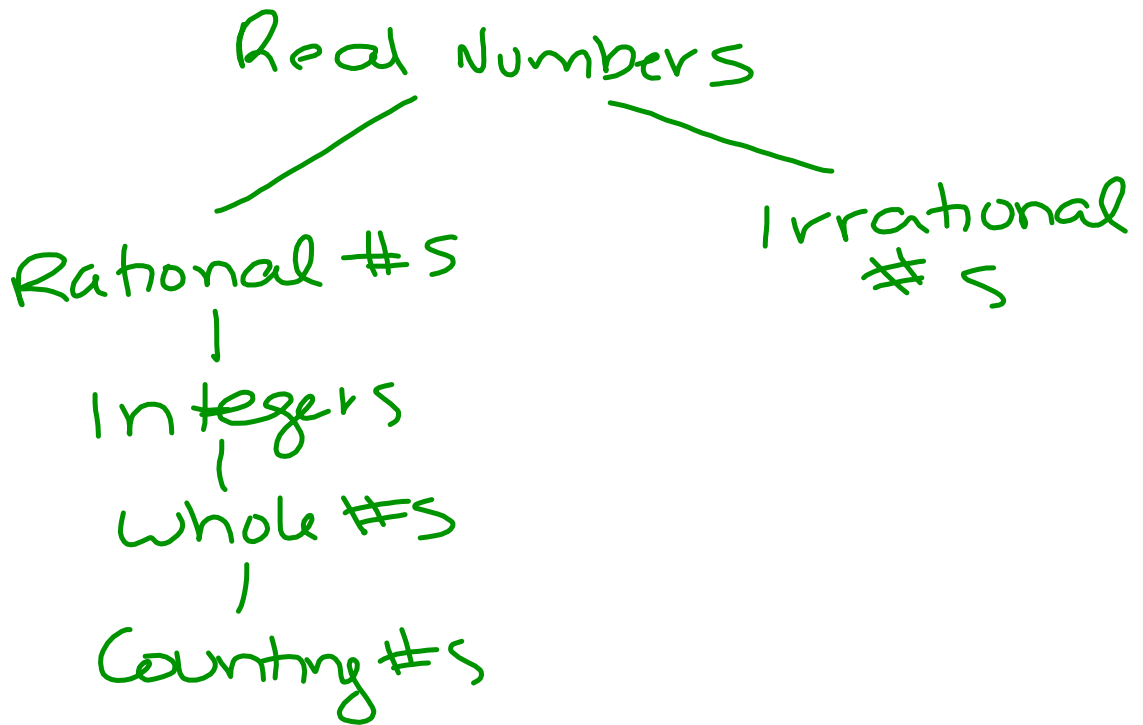


Review for Final

Unit 1: Algebra Foundations

The Real Number System

	Definition	Example
Natural (Counting) numbers	Counting Numbers	1, 2, 3, 4, 5, ...
Whole numbers	Counting Numbers + Zero	0, 1, 2, 3, 4, 5, ...
Integers	Whole Numbers and their Opposites	... -3, -2, -1, 0, 1, 2, 3, ...
Rational numbers	Any number that can be expressed as a ratio of two integers $\frac{a}{b}, b \neq 0$	Fractions, decimals that repeat or terminate $\frac{1}{2}, 0.2, 0.\bar{3}$
Irrational numbers	Nonrepeating, Nonterminating Decimals	π 0.123576...



Name the smallest set to which each number belongs:

1. $\frac{2}{3}$ Rational #s 2. 13 Counting # 3. 0 Whole #s

4. $-\sqrt{50}$ Irrational 5. $-\frac{28}{7}$ Integer 6. π Irrational

NORMAL FLOAT AUTO REAL RADIAN MP

$-\sqrt{50}$ -7.071067812

NORMAL FLOAT AUTO REAL RADIAN MP

$-\frac{28}{7}$ -4

Property	Main Idea	Examples
Commutative Property Addition or Multiplication	<u>Order</u> of the values does not matter!	$1+2=2+1$ $2 \cdot 3=3 \cdot 2$
Associative Property Addition or Multiplication	<u>Grouping</u> of the values does not matter!	$(5+3)+4=5+(3+4)$ $(ab)c=a(bc)$
Identity Property	<u>Stay the same!</u>	$a+\boxed{0}=a$ $a \cdot \boxed{1}=a$
Inverse Property mult: reciprocal	Using <u>Opposite</u> to "cancel" a value!	$a+\boxed{-a}=0$ $a \cdot \boxed{\frac{1}{a}}=1$
Zero Product Property	Multiply by <u>0</u> always equals <u>0</u> !	$a \cdot 0=0$
Distributive Property	<u>multiply</u> a value to an expression inside <u>()</u> .	$a(b+c)=ab+ac$
Reflexive Property "reflection"	A value will always equal itself	$a=a$ $2x=2x$
Symmetric Property	if $a=b$ then $b=a$	if $3=x$, then $x=3$
Transitive Property	if $a=b$ and $b=c$ then $a=c$	if $4+3=7$ and $7=\sqrt{49}$ then $4+3=\sqrt{49}$

Identify the following properties:

1. $5x + 1 = 1 + 5x$ Commutative Property
2. $17 = 17$ Reflexive Property
3. $10y^2 \cdot 0 = 0$ Zero Product Property
4. $-3(x + 8) = -3x - 24$ Distributive Property
5. If $2^5 = 32$ and $32 = 8 \cdot 4$, then $2^5 = 8 \cdot 4$ Transitive Property
6. $8k + 0 = 8k$ Identity Property of Addition
7. If $-2x = 20$, then $20 = -2x$ Symmetric Property
8. $\frac{4}{9} \cdot \frac{9}{4} = 1$ Inverse Property of Multiplication

Square Roots & Cube Roots

1. $\sqrt{25}$ 5	2. $\sqrt{144}$ 12	3. $\sqrt{64}$ 8	4. $\sqrt{\frac{16}{49}} = \frac{\sqrt{16}}{\sqrt{49}} = \frac{4}{7}$
5. $\sqrt[3]{27}$ 3	6. $\sqrt[3]{216}$ 6	7. $\sqrt[3]{8}$ 2	8. $\sqrt[3]{1000}$ 10

* use calculator !!

Exponent Rules

PRODUCT RULE	POWER RULE	QUOTIENT RULE	NEGATIVE EXPONENT RULE
$x^a \cdot x^b =$ x^{a+b}	$(x^a)^b =$ x^{ab}	$\frac{x^a}{x^b} =$ x^{a-b}	$x^{-a} =$ $\frac{1}{x^a}$
1. $v^4 \cdot 7v^3 \cdot 5v$	2. $(3x^2y^2)^3$	3. $(-2a^6bc^3)^2 \cdot -5ab^2$	