

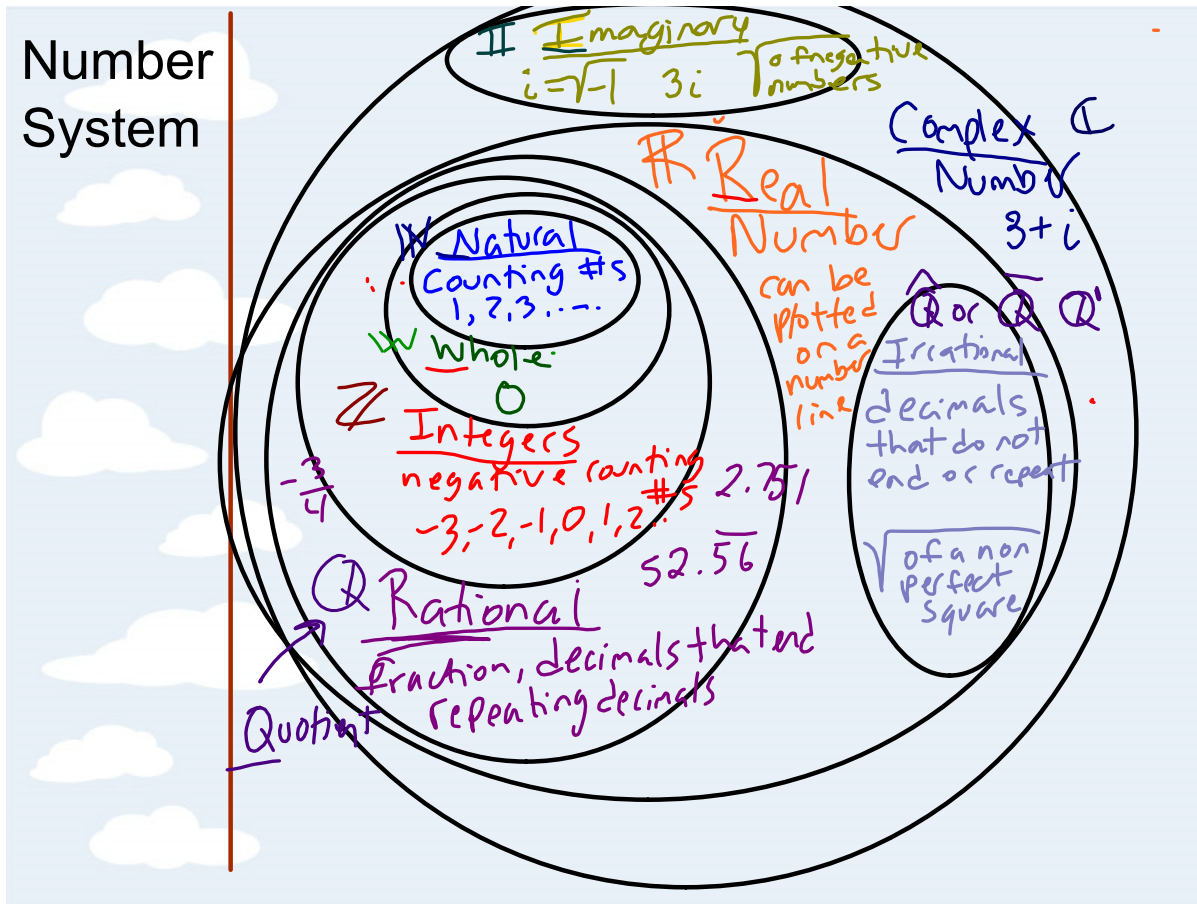
Your Name

Mrs. Theo

8/23/2021

Notes

The Complex  
Number Systems:  
Sets of numbers



Number System  
Identify a number

List all the number sets each of these are in:

(Hint: Simplify if you can, then find the smallest set it is included in and list all the sets that have that set inside them)

1.  $\sqrt[3]{125} = 5 \in \mathbb{N}, \mathbb{W}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}$

2.  $\sqrt{10} \in \mathbb{Q}, \mathbb{R}, \mathbb{C}$  (with "element of" written above the Q)

3.  $\sqrt{-16} = 4i \in \mathbb{I}, \mathbb{C}$

4.  $-3/2 \in \mathbb{Q}, \mathbb{R}, \mathbb{C}$  (with "element of" written below the Q)

5.  $\sqrt[3]{-8} = -2 \in \mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}$  (with "-2 · -2 · 2" written to the left)

6.  $\sqrt{-50} \in \mathbb{I}, \mathbb{C}$

7.  $0.\underline{567}567567\dots = 0.\overline{567} \in \mathbb{Q}, \mathbb{R}, \mathbb{C}$

8.  $-10/2 = -5 \in \mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}$

Algebra 2 Unit 1, Lesson 2: Classwork 1-2

Section: \_\_\_\_\_ Name: \_\_\_\_\_

DATE: 8/23/21 Your Name: Mrs. Theo

### Classifying Real Numbers

Directions: Write each number in the correct location on the Venn Diagram of the real number system. Each number should be written only once.

6, 2/3, 3/4, √2, √9, -100, 0, π, 1, -1/2, -3.8, 5.42, 8.293017, 3+i√2

True or false? If false, explain why.

- All whole numbers are integers.
- All integers are whole numbers.
- Some rational numbers are integers.
- Some whole numbers are irrational numbers.



### Understanding Real Numbers

1) List the numbers in the set  $\left\{\frac{4}{5}, -18, i\sqrt{4}, 0, \sqrt{5}, -\frac{1}{2}, -2.0i, 5, \pi, 2.513, 5.1823159\dots\right\}$  that are:

- Whole numbers
- Integers
- Rational numbers
- Irrational numbers
- Real numbers
- Imaginary numbers

2) Put a check mark for **each set** that the number is a part of:

	Whole Numbers	Integers	Rational Numbers	Irrational Numbers	Real Numbers	Imaginary Numbers	Complex Numbers
-7							
$\frac{3}{4}$							
$\sqrt{2}$							
5							
0.398							

- 3) True or false? If false, explain why.
- All integers are rational.
  - If a number is rational, then it must be a whole number.
  - Some irrational numbers are integers.
  - All irrational numbers are real numbers.
  - No whole numbers are integers.
  - All numbers are complex numbers.

## Homework Key

DATE:  

Algebra 2 Unit 1, Lesson 2: Classwork 1-2 Section: Name: Key

### Classifying Real Numbers

Directions: Write each number in the correct location on the Venn Diagram of the real number system. (Each number should be written only once.)

Numbers:  $\{-6, 2.73, \frac{3}{7}, \sqrt{2}, \sqrt{5}, -100i, 0, \pi, 1, -\frac{1}{2}, -3.8, 5.42, 8.293017\dots, 3+i\sqrt{2}\}$

**True or false? If false, explain why.**

- All whole numbers are integers. **True**
- All integers are whole numbers. **False**  $-4 \in \mathbb{Z}$  but not  $\mathbb{W}$
- Some rational numbers are integers. **True**  $\frac{24}{2} = 12 \in \mathbb{Z}$
- Some whole numbers are irrational numbers. **False** They are separate sets with no overlap

### Understanding Real Numbers

1) List the numbers in the set  $\left\{\frac{4}{5}, -18, i\sqrt{4}, 0, \sqrt{5}, -\frac{1}{2}, -2.0i, 5, \pi, 2.513, 5.1823159\dots\right\}$  that are:

- Whole numbers 0, 5
- Integers 0, 5, -18
- Rational numbers 0, 5,  $\frac{4}{5}$ , -18,  $-\frac{1}{2}$ , 2.513
- Irrational numbers  $\sqrt{5}$ , 5.1823159...
- Real numbers 0, 5,  $\frac{4}{5}$ , -18,  $-\frac{1}{2}$
- Imaginary numbers  $i\sqrt{4}$ ,  $-2.0i$

2) Put a check mark for **each set** that the number is a part of:

	Whole Numbers	Integers	Rational Numbers	Irrational Numbers	Real Numbers	Imaginary Numbers	Complex Numbers
-7		✓	✓		✓		✓
$\frac{3}{4}$			✓		✓		✓
$\sqrt{2}$				✓	✓		✓
5	✓	✓	✓		✓		✓
0.398			✓		✓		✓

- 3) True or false? If false, explain why.
- All integers are rational. **True** you can write any integer as a fraction  $-5 = -\frac{5}{1} = -\frac{10}{2} = \dots$
  - If a number is rational, then it must be a whole number. **False**  $\frac{3}{4}$  is not a whole number but is rational
  - Some irrational numbers are integers. **False** you can't have a never repeating or ending decimal be an integer
  - All irrational numbers are real numbers. **True** you can plot  $\sqrt{5}$  on a number line between  $\sqrt{4}$  and  $\sqrt{9}$  (between 2 and 3)
  - No whole numbers are integers. **False** Integers include all positive whole numbers
  - All numbers are complex numbers. **True**