Tuesday, August 21, 2012

TISK Problems:

1. Write the name of the number: 0.0042
2. Divide 3484 ÷ 54
3. Multiply 36(87)

We will have 3 Mental Math Questions today.

Homework:
p. 59 #36-39 all, 44-48all, 50-64 evens

Number Systems

- There are many types of numbers that make up the numbers we work with in mathematics.
- All the numbers you will work with in this course are ***Real Numbers***.
- The symbol we use for Real numbers is $\mathbb{R}$.

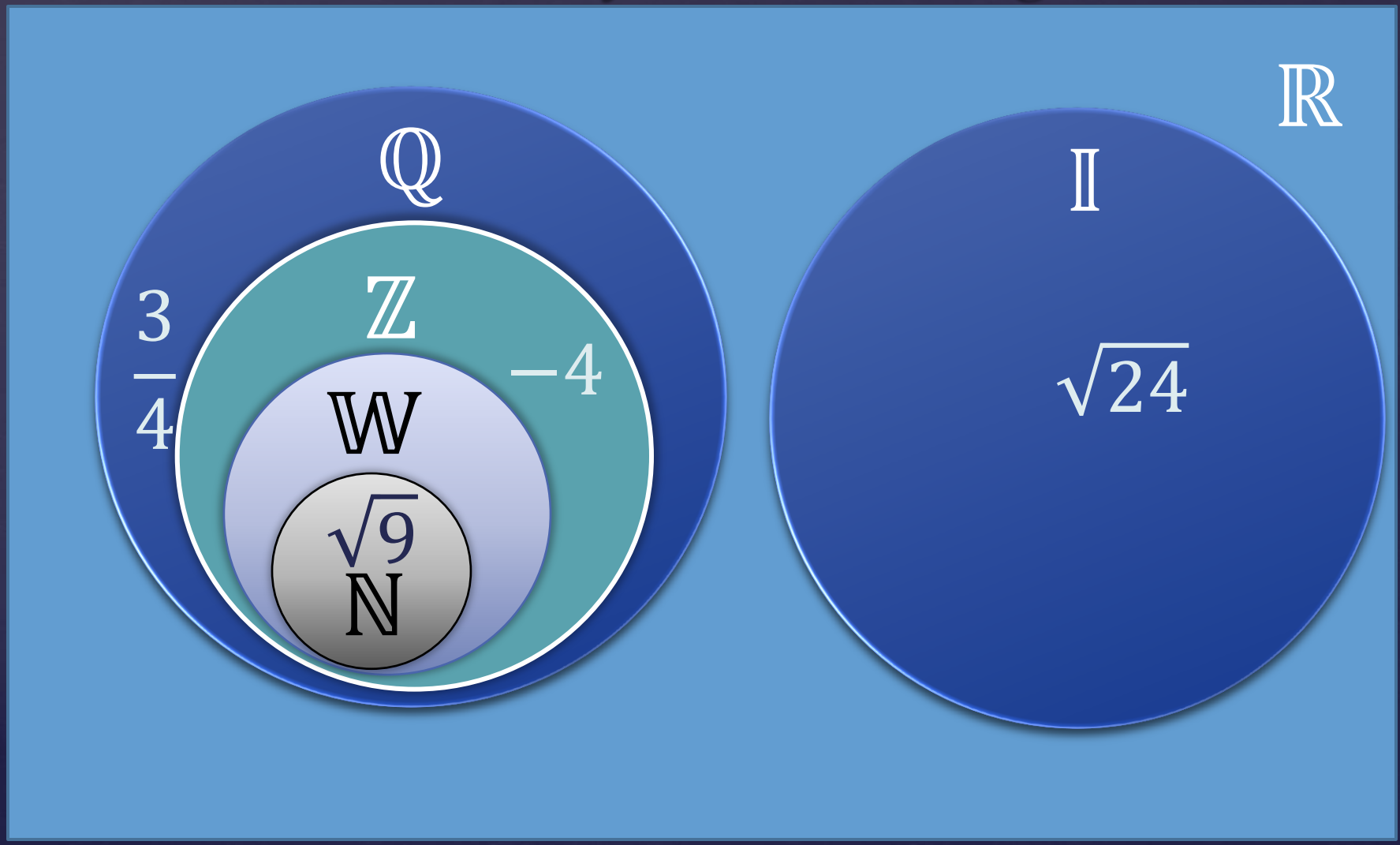
Number Systems

- Definitions:
  - Natural Numbers, $\mathbb{N}$:
    - The counting numbers
      - 1, 2, 3, …
  - Whole Numbers, $\mathbb{W}$:
    - All the Natural Numbers and 0
      - 0, 1, 2, 3, …
  - Integers, $\mathbb{Z}$:
    - Positive and negative whole numbers
      - … -3, -2, -1, 0, 1, 2, 3, …

Number Systems

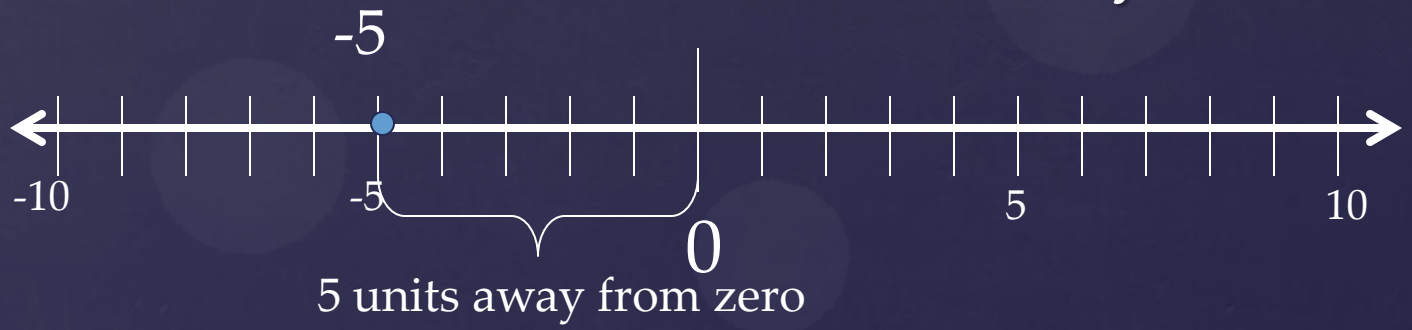
- Rational Numbers, $\mathbb{Q}$:
  - Numbers that can be written as a ratio of two integers, a and b, such that it is equal to $\frac{a}{b}$
    - $\ldots, -\frac{1}{2}, \frac{0}{2}, \frac{1}{2}, \frac{2}{2}, \frac{3}{2}, \ldots$
- Irrational Numbers, $\mathbb{I}$:
  - Numbers that cannot be written as a ratio of two integers.
    - $\ldots, -\sqrt{7}, \sqrt{7}, \pi, \ldots$

How do these systems fit together?



Absolute Value

- Absolute Value
  - Definition: the distance a number is away from zero.



So, the absolute value of -5 is 5.

Symbols

- We use the | | bars to indicate absolute value.
- So, the absolute value of -5 would be written like so:

$$|-5| = 5$$

Check Point.

- Find the absolute value of each of the given numbers:

a) -8 $|-8| = 8$

b) 12 $|12| = 12$

c) -17 $|-17| = 17$

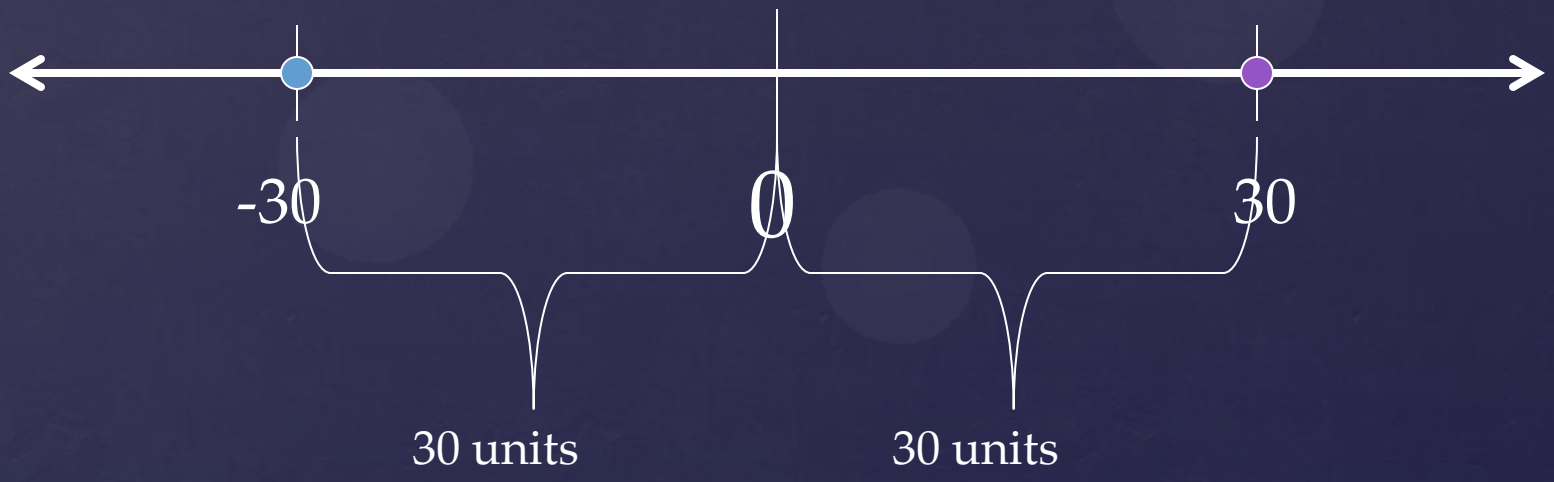
d) 5 $|5| = 5$

e) -3.2 $|-3.2| = 3.2$

f) 4.1 $|4.1| = 4.1$

Opposites

- Two numbers that have the same absolute value are said to be opposites.



So, -30 and 30 are opposites.

Check Point.

& State the opposite of the given numbers.

a) 32

The opposite of 32 is -32.

b) -8

The opposite of -8 is 8.

c) 7.2

The opposite of 7.2 is -7.2.

d) -4.9

The opposite of -4.9 is 4.9.

e) 81

The opposite of 81 is -81.

f) 0 The opposite of 0 is 0.

Evaluating Absolute Value Expressions

- When you have expressions with absolute value signs, you always evaluate the absolute value signs first!

$$8 - |-7| = 8 - 7 = 1$$

$$-|12| = -12 = -12$$

$$5 + |-4| - |16 - 9| = 5 + 4 - |7| = 5 + 4 - 7 = 9 - 7 = 2$$

Check Point.

- Evaluate the expressions when $x = -2$.

a) $|x| + 5$

$|-2| + 5 = 2 + 5 = 7$

c) $-|x|$

$-|-2| = -2$

b) $|x| + 2|x|$

$|-2| + 2|-2|$

$2 + 2 \cdot 2 = 2 + 4 = 6$

d) $3|x| - |x|$

$3|-2| - |-2|$

$3 \cdot 2 - 2 = 6 - 2 = 4$

Homework

p. 59 #36-39 all, 44-48all, 50-64 evens