Name: _____ Date: _____

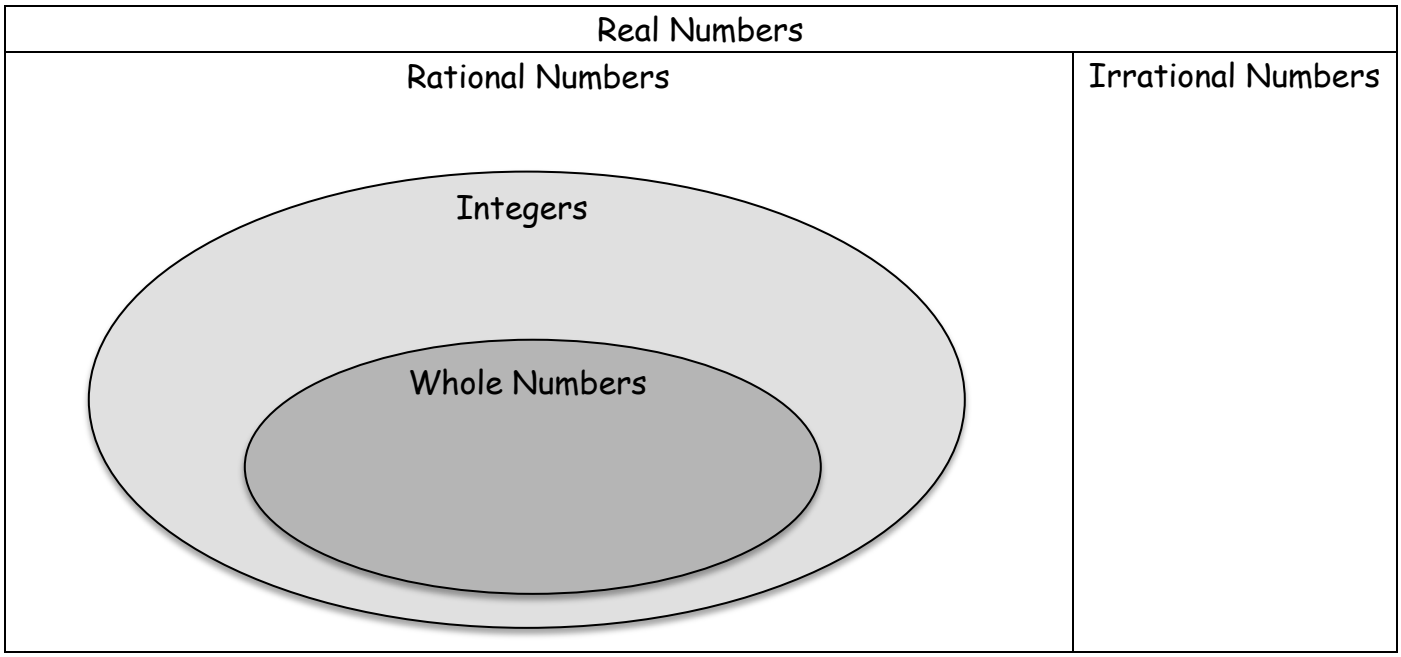
Rational and Irrational Number Notes

8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion, which repeats eventually into a rational number.

Rational Number –

Irrational Number –

Place the numbers in the correct place in the Venn diagram.



Reflect:

1) Consider the decimal 0.202002000200002000002... Do you think this decimal represents a rational number? Why or why not?

2) Do you think a negative sign affects whether or not a number is a rational number?

Use $-\frac{4}{5}$ as an example. Why or why not?

3) Do you think a mixed number is a rational number? Explain.

Long Division Time:

Write the following fractions as decimals:

1. $\frac{5}{16}$

2. $\frac{2}{11}$

Question…Do you think that decimals that have repeating patterns always have the same number of digits in their pattern? Explain.

Writing Mixed Numbers as Decimals

Ms. Haley bought $3\frac{1}{8}$ yards of material to make an outfit for her daughter. Write $3\frac{1}{8}$ as a decimal.

Step 1: Turn to improper fraction $3\frac{1}{8}$

Step 2: Divide numerator by denominator

Practice:

A. Abbey made $4\frac{1}{5}$ quarts of Kool-Aid. Write $4\frac{1}{5}$ as a decimal.

B. Josh bought a cantaloupe that weighed $6\frac{2}{3}$ pounds. Write $6\frac{2}{3}$ as a decimal.

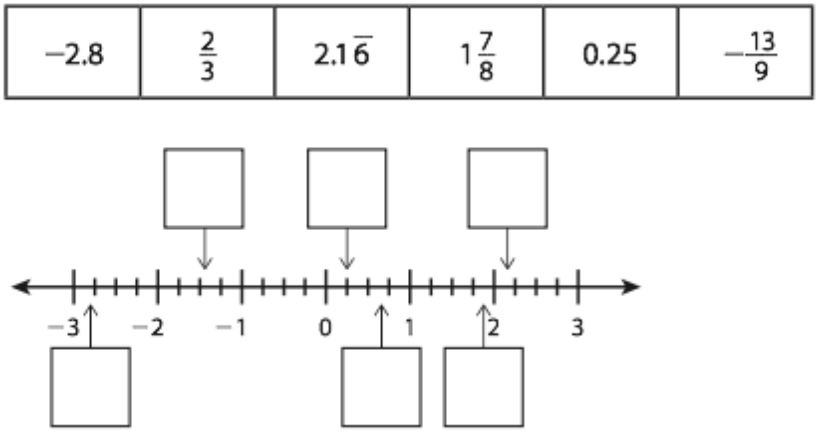
Write each of the following fractions or improper fractions as decimals.

C. $-\frac{7}{20}$ D. $\frac{23}{4}$ E. $\frac{58}{8}$

Write the following as fractions/mixed numbers in lowest terms.

F. -0.4 G. 0.05 H. 0.75 I. -1.45 J. 4.35

K. Write each number in its appropriate box to show its placement along the number line.



Repeating Decimal as a Fraction

Consider the following:

A. $x = 0.\overline{3}$ $\quad (10)x = 10(0.\overline{3})$

$10x = 3.\overline{3}$ Because $x = 0.\overline{3}$ you can subtract x from one side

$-x \quad -0.\overline{3}$ and $0.\overline{3}$ from the other

$9x = 3$ *Now solve the equation for x.*

B. $x = 0.\overline{37}$ $\quad (100)x = 100(0.\overline{37})$

$100x = 37.\overline{37}$ Because $x = 0.\overline{37}$ you can subtract x from one

$- x \quad -0.\overline{37}$ side and $0.\overline{37}$ from the other

$99x = 37$ *Now solve the equation for x.*

C. $x = 0.\overline{512}$ $\quad (1000)x = 1000(0.\overline{512})$

$1000x = 512.\overline{512}$ Because $x = 0.\overline{512}$ you can subtract x from

$- x \quad -0.\overline{512}$ one side and $0.\overline{512}$ from the other.

$999x = 512$ *Now solve the equation for x.*

What pattern do you see?

Do you think it will work with all repeating decimals?

What is the fraction for:

a. 0.1111111111 b. 0. 135135135135 c. 0.3636363637 d. 0.666666667