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Rational Numbers

Unit 1 Lesson 1

Students will be able to:

- Understand informally that every number has a decimal expansion.
- Classify whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers.
- Order a set of rational numbers.

Key Vocabulary:

Rational numbers

Irrational numbers

Integers

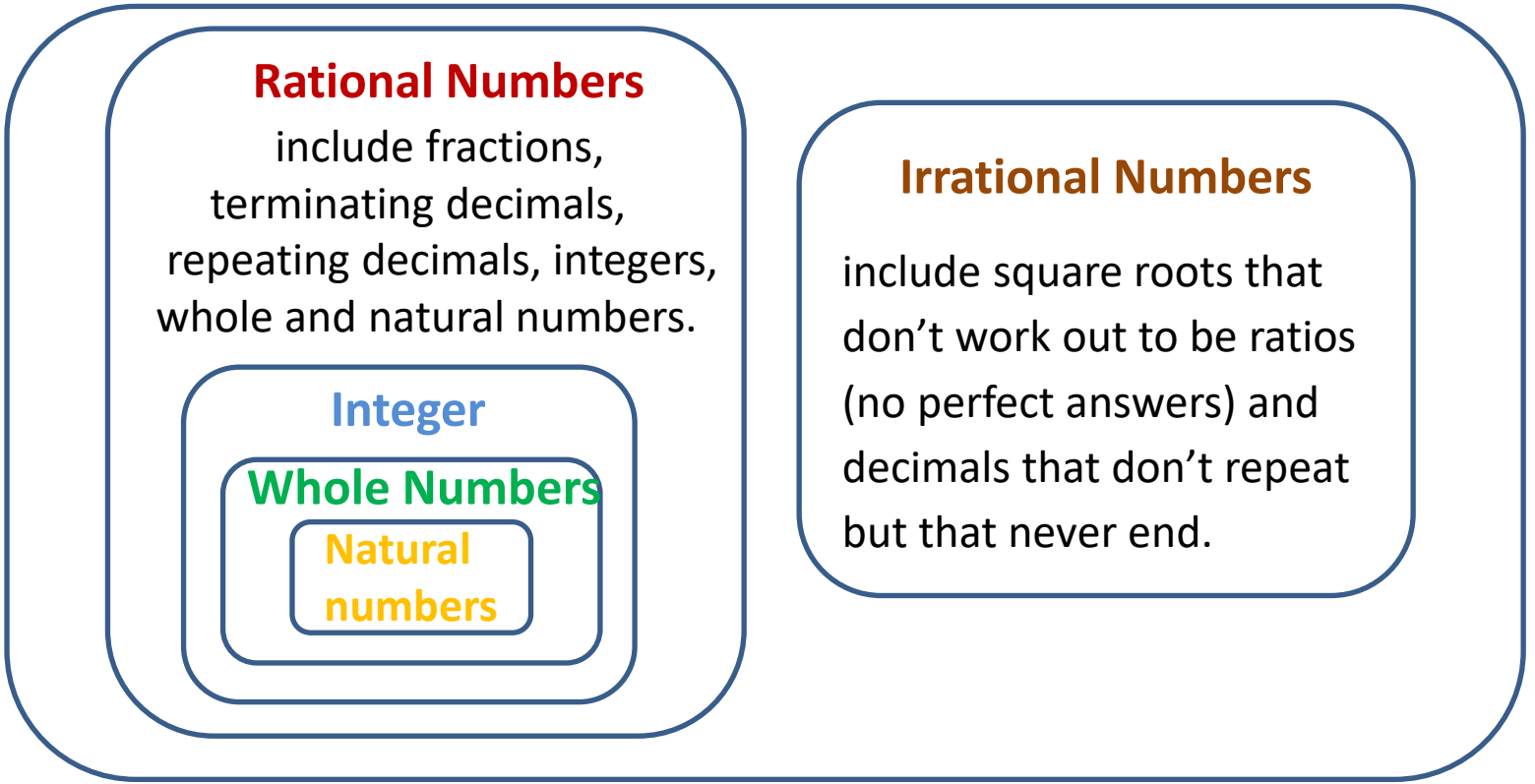
Whole numbers

Natural numbers

A rational number is a number that can be in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

A rational number can be made by dividing two integers, or it is a number that can be written as the ratio of two integers.

Rational Numbers



Sample Problem 1: Identify each number as rational or irrational.

a.

$\frac{-2}{4}$	
$12.1\overline{7}$	
$\sqrt{36}$	
$\sqrt{32}$	

Sample Problem 1: Identify each number as rational or irrational.

a.

$\frac{-2}{4}$	Rational
$12.1\overline{7}$	Rational
$\sqrt{36}$	Rational
$\sqrt{32}$	Irrational

Sample Problem 1: Identify each number as rational or irrational.

b.

$\frac{18}{6}$	
$\pi = 3.141591 \ldots \ldots \ldots$	
$\sqrt{121}$	
$\sqrt{56}$	

Sample Problem 1: Identify each number as rational or irrational.

b.

$\frac{18}{6}$	Rational
$\pi = 3.141591 \ldots \ldots \ldots$	Irrational
$\sqrt{121}$	Rational
$\sqrt{56}$	Irrational

Sample Problem 2: Write the numbers in order from least to greatest.

a. $\frac{1}{2}, \quad \frac{2}{3}, \quad \frac{2}{6}, \quad \frac{-5}{6}$

Sample Problem 2: Write the numbers in order from least to greatest.

a. $\frac{1}{2}, \quad \frac{2}{3}, \quad \frac{2}{6}, \quad \frac{-5}{6}$

$$\frac{-5}{6} < \frac{2}{6} < \frac{1}{2} < \frac{2}{3}$$

Sample Problem 2: Write the numbers in order from least to greatest.

b. $-2.1,$ $-2.13,$ $-2.2,$ -2.123

Sample Problem 2: Write the numbers in order from least to greatest.

b. $-2.1, \quad -2.13, \quad -2.2, \quad -2.123$

$$-2.2 < -2.13 < -2.123 < -2.1$$

Sample Problem 2: Write the numbers in order from least to greatest.

c. $\frac{2}{3}, \quad \frac{-1}{6}, \quad \frac{5}{6}, \quad \frac{-1}{2}$

Sample Problem 2: Write the numbers in order from least to greatest.

c. $\frac{2}{3}, \quad \frac{-1}{6}, \quad \frac{5}{6}, \quad \frac{-1}{2}$

$$\frac{-1}{2} < \frac{-1}{6} < \frac{2}{3} < \frac{5}{6}$$

Sample Problem 2: Write the numbers in order from least to greatest.

d. $4.1,\quad -4.1,\quad -3.50,\quad 3.5$

Sample Problem 2: Write the numbers in order from least to greatest.

d. $4.1,\quad -4.1,\quad -3.50,\quad 3.5$

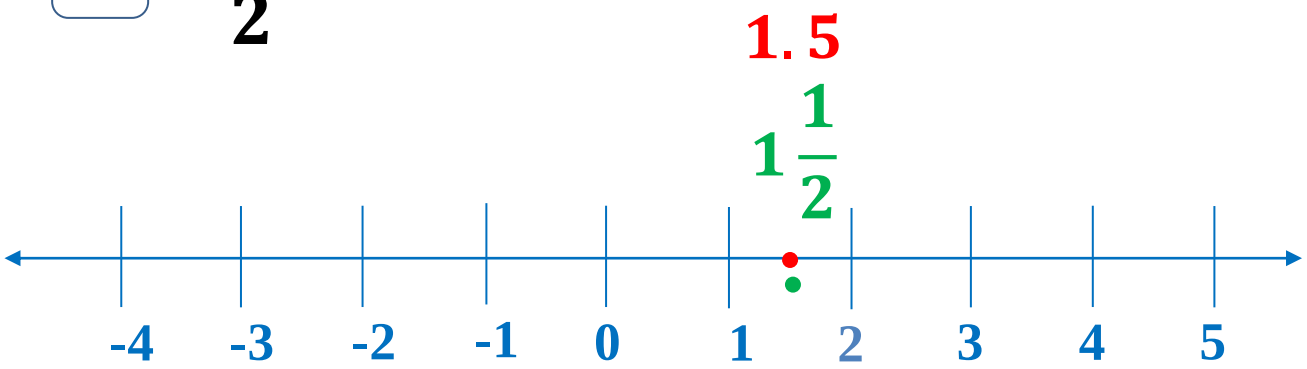
$$-4.1 < -3.50 < 3.5 < 4.1$$

Sample Problem 3: Graph each pair of numbers on the number line. Use the graph and write $<, or > or =$ to compare the numbers.

a. $1.5 \square 1\frac{1}{2}$

Sample Problem 3: Graph each pair of numbers on the number line. Use the graph and write $<, or > or =$ to compare the numbers.

a. $1.5 \boxed{=} 1\frac{1}{2}$

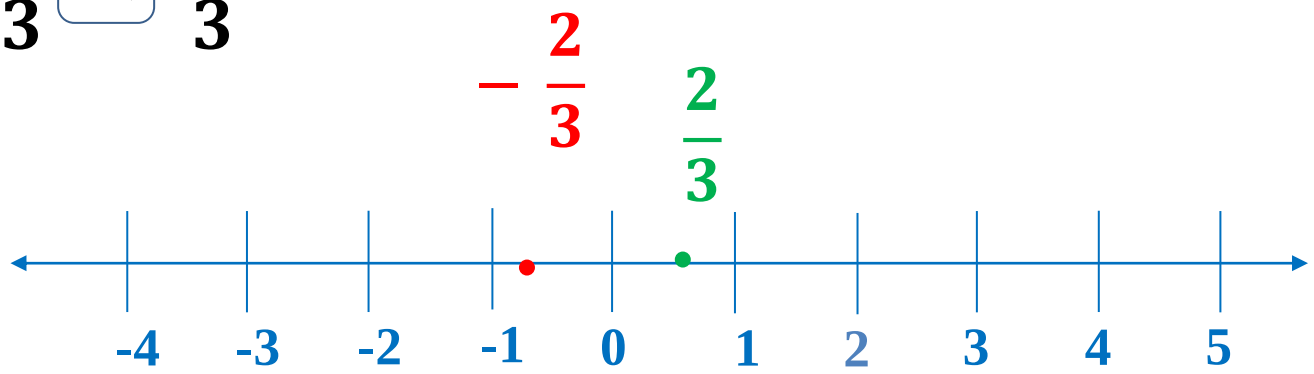


Sample Problem 3: Graph each pair of numbers on the number line. Use the graph and write $<, or > or =$ to compare the numbers.

b. $-\frac{2}{3} \square \frac{2}{3}$

Sample Problem 3: Graph each pair of numbers on the number line. Use the graph and write $<, or > or =$ to compare the numbers.

b. $-\frac{2}{3} \boxed{<} \frac{2}{3}$

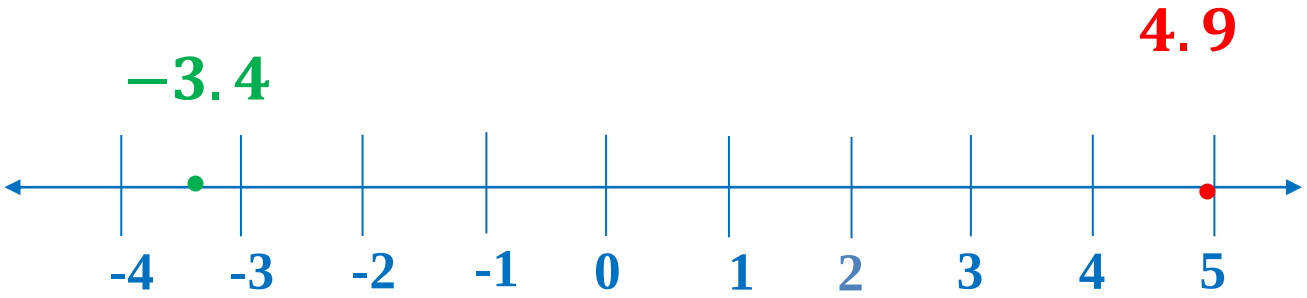


Sample Problem 3: Graph each pair of numbers on the number line. Use the graph and write $<, or > or =$ to compare the numbers.

c. $4.9 \square -3.4$

Sample Problem 3: Graph each pair of numbers on the number line. Use the graph and write $<, or > or =$ to compare the numbers.

c. $4.9 \boxed{>} -3.4$

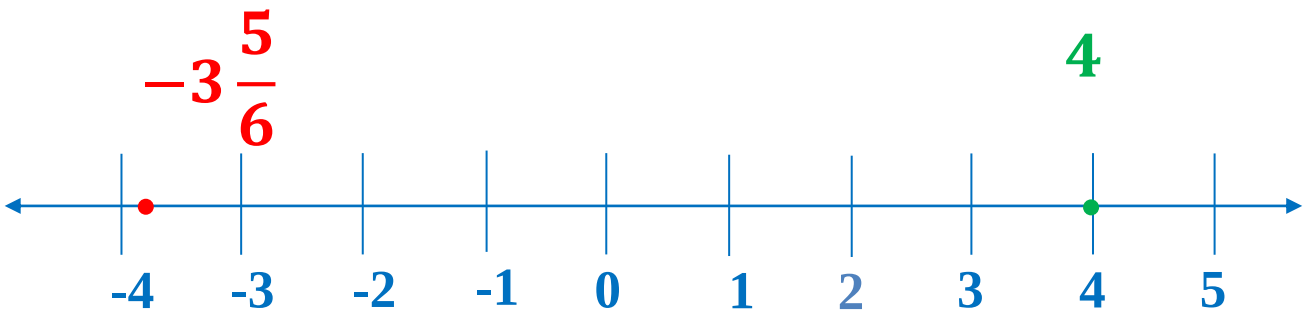


Sample Problem 3: Graph each pair of numbers on the number line. Use the graph and write $<, or > or =$ to compare the numbers.

d. $-3\frac{5}{6}$ ☐ 4

Sample Problem 3: Graph each pair of numbers on the number line. Use the graph and write $<, or > or =$ to compare the numbers.

d. $-3\frac{5}{6}$ $\boxed{<}$ 4



Sample Problem 4: Identify each decimal as repeating or terminating.

a.

-0.5	
1.6666	
$2.\overline{3}$	
14.05	

Sample Problem 4: Identify each decimal as repeating or terminating.

a.

-0.5	terminating decimal
1.6666	repeating decimal
$2.\overline{3}$	repeating decimal
14.05	terminating decimal

Sample Problem 4: Identify each decimal as repeating or terminating.

b.

$-0.131313..$	
1.65	
$2.\overline{21}$	
-4.12	

Sample Problem 4: Identify each decimal as repeating or terminating.

b.

$-0.131313..$	repeating decimal
1.65	terminating decimal
$2.\overline{21}$	repeating decimal
-4.12	terminating decimal