

Chapter 1

Real Numbers

Lesson 1.1 Day 1

Rational and Irrational Numbers

What Do I Need For Class Today?

- My Interactive Notebook
- Tape/ Glue
- 2 3x5 Cards
- 4 Sticky Notes
- Colors

What is a Rational Number?

Rational Number

- Any number that can be expressed as a fraction, where a & b are both integers and $b \neq 0$

Rational Number

- Any number that can be expressed as a fraction, where a & b are both integers and $b \neq 0$

- Example: $\frac{2}{1}, \frac{1}{3}, \frac{0}{2}$

How can we express a rational number as a decimal?

Rational Number as Decimal

- To express a rational number as a decimal divide the NUMERATOR by the DENOMINATOR

Rational Number as Decimal

- To express a rational number as a decimal divide the NUMERATOR by the DENOMINATOR

- Example: $\frac{3}{4} = \frac{\textit{numerator}}{\textit{denominator}}$

Practice

Work on “Guided
Practice” Numbers 1-6

The Decimal form of a Rational Number:

The Decimal form of a Rational Number:

- Repeating : One number of combination repeats
- Example : $\frac{5}{6}$

The Decimal form of a Rational Number:

- Terminating : The decimal ends

- Example : $\frac{1}{4}$

How can we express a rational number as a fraction?

How can we express a rational number as a fraction?

- Terminating Decimal:

- Step 1: Figure out what place value the LAST number is in
 - Step 2: Write over that many zeros
 - Step 3: Simplify

How can we express a rational number as a fraction?

- Terminating Decimal:
- Step 1: Figure out what place value the LAST number is in
- Step 2: Write over that many zeros
- Step 3: Simplify

- Example: 0.825

- Step 1: 0.825 Thousandths

- Step 2: $\frac{825}{1000}$

- Step 3: $\frac{825}{1000} \div \frac{25}{25} = \frac{33}{40}$

- *What we do to the top, we must do to the bottom*

How can we express a rational number as a fraction?

- Repeating Decimal:

- Step 1: Set $x =$ decimal
- Step 2: Multiply both sides by 100
- Step 3: Subtract from both sides
- Step 4: Solve for x by dividing

How can we express a rational number as a fraction?

- Repeating Decimal:
 - Step 1: Set $x =$ decimal
 - Step 2: Multiply both sides by 100
 - Step 3: Subtract from both sides
 - Step 4: Solve for x by dividing
- Example: $0.\overline{37}$
 - Step 1: $x = 0.\overline{37}$
 - Step 2: $100x = 37.\overline{37}$
 - Step 3:
$$\begin{array}{r} -x \\ \hline -.\overline{37} \end{array}$$
 - Step 4:
$$\begin{array}{r} 99x = 37 \\ \hline 99 \quad 99 \end{array}$$
 - $x = \frac{37}{99}$

Practice

Work on “Guided
Practice” Numbers
7-12

What is a Square Root?

Square Root

2!!



Positive or Negative Answer

Square Root

$$x^2 = p$$

$$6^2 = 36$$

$$\sqrt{36} = 6 \text{ or } -6$$

Perfect Square

- Square root is an integer

- $\sqrt{49} = 7$

What is a Cube Root?

Cube Root

3!!

$$\sqrt[3]{\quad}$$

Positive Answer

Cube Root

$$x^3 = p$$

$$2^3 = 8$$

$$\sqrt[3]{8} = 2$$

What is a Perfect Cube?

Perfect Cube

- Cube root is an integer

$$\bullet \sqrt[3]{125} = 5$$

Practice

Work on “Guided
Practice” Numbers
13-15

Homework

Work on Homework 1.1
Worksheets Pages 1
(#s 1-20) & 3 (#s 1-12)

Lesson 1.1 Day 2

Rational and Irrational Numbers

What Do I Need For Class Today?

- My Interactive Notebook
- Colors

What is an irrational number?

Irrational Number

- Not Rational
- Square roots that are not perfect squares
- $\sqrt{2}$ is irrational!

How can we estimate square roots?

Estimate Square Roots

- Estimate $\sqrt{3}$
- Find the perfect squares it's between

$$\bullet \sqrt{1} < \sqrt{3} < \sqrt{4}$$

$$\bullet 1 < \sqrt{3} < 2$$

$$\bullet \approx 1.7$$

Estimate Square Roots

- Estimate $\sqrt{45}$

Estimate Square Roots

- Estimate $\sqrt{45}$

- $\sqrt{36} < \sqrt{45} < \sqrt{49}$

- $6 < \sqrt{45} < 7$

- ≈ 6.7

Practice

Work on the skipped
problems from last
night homework

Practice

Work on “Guided
Practice” Numbers
16-18

Homework

Work on Homework 1.1
Independent Practice
#s 20-34 EVENS

Lesson 1.2

Sets of Real Numbers

What Do I Need For Class Today?

- My Interactive Notebook
- Tape/ Glue
- Scissors
- Real Number Systems Chart
- 1 Page 4 Flap Book
- Colors

What is the Real Number System?

Real Number System

- Irrational Numbers
 - Numbers that are not rational
 - Square roots of numbers that aren't perfect square
- Examples:
 - π
 - $\sqrt{38}$
 - $\sqrt{17}$
 - $\pi + 3$

Real Number System

- Rational Numbers
 - A number that can be written as a fraction
- Examples:
 - .16
 - $\sqrt{25}$
 - $\frac{17}{5}$
 - $\sqrt{1}$
 - $4.\bar{7}$

Real Number System

- Integers
 - Positive or negative whole numbers
- Examples:
 - 1,783
 - -31
 - -27
 - 17
 - $\frac{-20}{5}$

Real Number System

- Whole Numbers
 - Positive numbers
 - Includes 0
 - No fractions
- Examples:
 - 1,900
 - 0
 - 16
 - 8,123

Real Number System

- Natural Numbers
 - Positive Whole numbers
 - No fractions
- Examples:
 - 2,200
 - 193
 - 10
 - 1

Practice

Work on “Guided
Practice” Numbers
1-8

Practice

Work on “Guided
Practice” Numbers
9-12

Homework

Work on Homework 1.2
Independent Practice
#s 14-22 & Worksheet
Page 7

Lesson 1.3

Ordering Real Numbers

What Do I Need For Class Today?

- My Interactive Notebook
- Tape/ Glue
- Scissors
- 1 Page 2 Flap Books
- Colors

How can we compare irrational numbers?

Comparing Irrational Numbers

- Estimate the irrational numbers!

$$\bullet \sqrt{3} + 5 \quad \underline{\hspace{2cm}} \quad 3 + \sqrt{5}$$

Comparing Irrational Numbers

- $\sqrt{3} + 5$

- $1 + 5$

- $\sqrt{1} \quad \sqrt{3} \quad \sqrt{4}$

- OR

- $1 \quad \sqrt{3} \quad 2$

- $2 + 5$

- *6 or 7*

Comparing Irrational Numbers

- $3 + \sqrt{5}$

- $\sqrt{4} \quad \sqrt{5} \quad \sqrt{9}$

- $2 \quad \sqrt{5} \quad 3$

- $2 + 3$

- OR

- $3 + 3$

- *5 or 6*

Comparing Irrational Numbers

- Estimate the irrational numbers!

$$\bullet \sqrt{3} + 5 \underline{\hspace{1cm}} > \hspace{1cm} 3 + \sqrt{5}$$

Practice

Work on “Guided
Practice” Numbers
1-8 ODDS

How can we order real numbers?

Order Real Numbers

- Order $\sqrt{22}$, $\pi + 1$, and $4\frac{1}{2}$ from least to greatest

Order Real Numbers

$$\sqrt{22}$$

- $\sqrt{22}$ is between 4 and 5. Since we don't know where it falls between 4 and 5, we need to find a better estimate so we can compare it to $4\frac{1}{2}$
- Since 22 is closer to 25 than 16 we want to check numbers closer to 5
- $4.5^2 = 20.25$ $4.6^2 = 21.16$ $4.7^2 = 22.09$ $4.8^2 = 23.04$
- So we can approximate the value to about 4.7

Order Real Numbers

$$\pi + 1$$

- An approximation to pi is 3.14
- Add 1
- So $\pi + 1 \approx 4.14$

Order Real Numbers

$$4\frac{1}{2}$$

- We know that $\frac{1}{2}$ is equal to a decimal of .5
- $4 + .5 = 4.5$

Order Real Numbers

- Order $\sqrt{22}$, $\pi + 1$, and $4\frac{1}{2}$ from least to greatest
- $\sqrt{22} \approx 4.7$
- $\pi + 1 \approx 4.14$
- $4\frac{1}{2} \approx 4.5$

Order Real Numbers

• Order $\sqrt{22}$, $\pi + 1$, and $4\frac{1}{2}$ from least to greatest

• $\sqrt{22} \approx 4.7$

• $\pi + 1 \approx 4.14$

• $4\frac{1}{2} \approx 4.5$

$$\pi + 1, 4\frac{1}{2}, \sqrt{22}$$

Practice

Work on “Guided
Practice” Numbers
9 & 10

Homework

Work on Homework 1.3
Independent Practice
#s 12-15, 18-20, & 24 &
Worksheet Page 13