



# Chapter 3

## Rational Numbers

## 3.1B Terminating and Repeating Decimals

- I can write fractions as terminating or repeating decimals and write decimals as fractions.

# Vocabulary:

- Terminating decimal
- Repeating decimal

# Write Fractions as Decimals

- Any fraction can be written as a decimal by using long division


$$\frac{1}{2} = 2 \overline{)1.00} \quad 0.50$$

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# Examples:

Write  $-3/8$  as a decimal.

Write  $2 \frac{1}{8}$  as a decimal.

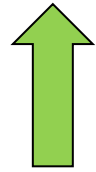


Repeating decimals: have a pattern that goes on forever

Convert  $1/3$  to a decimal. What do you notice?

What decimal place is this?

$$0.3 = \frac{3}{10}$$



tenth

$$0.34 = \frac{34}{100}$$



hundredth

$$= \frac{17}{50}$$

$$0.347 = \frac{347}{1000}$$



thousandth

$$5.347 = 5 \frac{347}{1000}$$



thousandth



# Homework:

p. 131 13-27 odd, 29-34



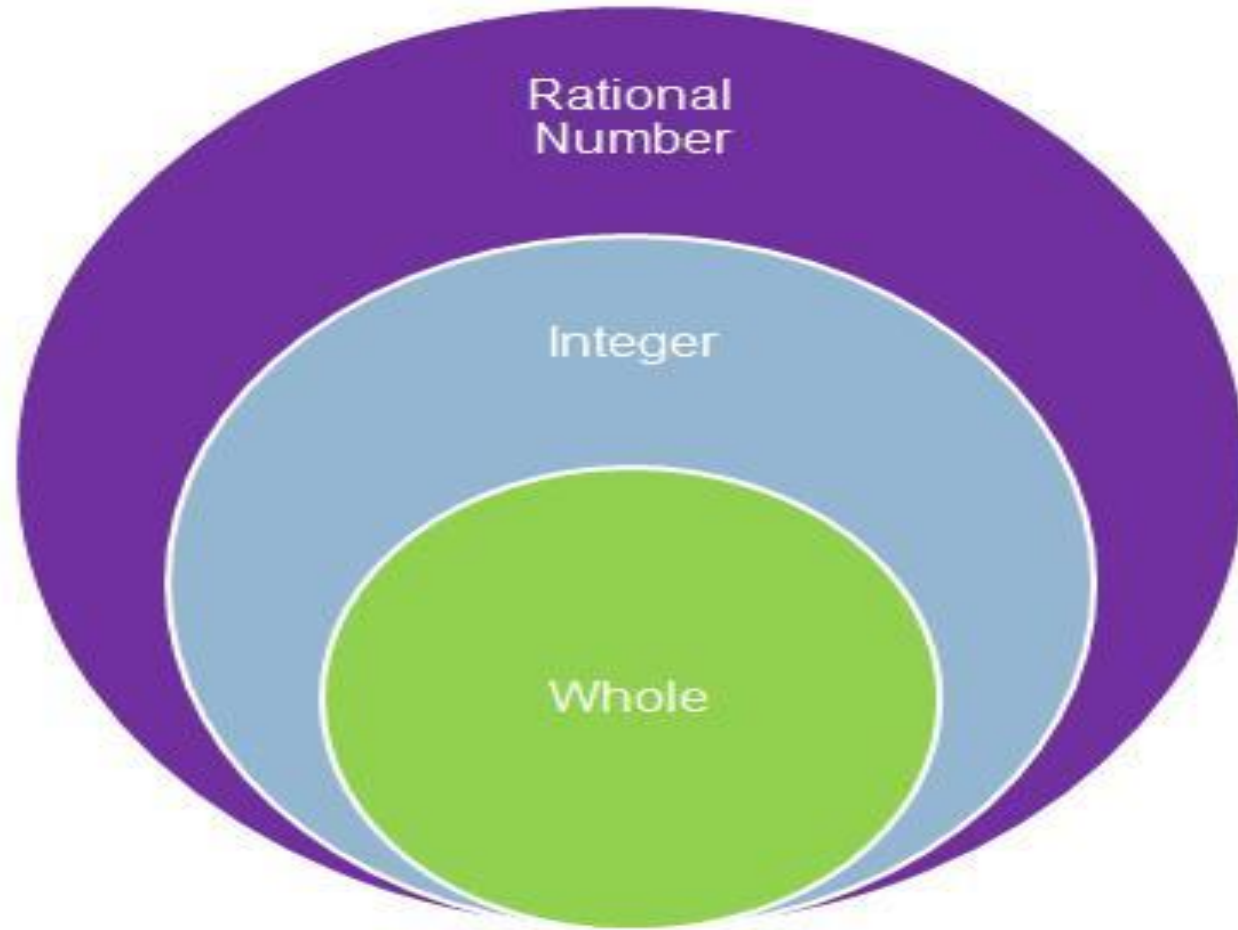
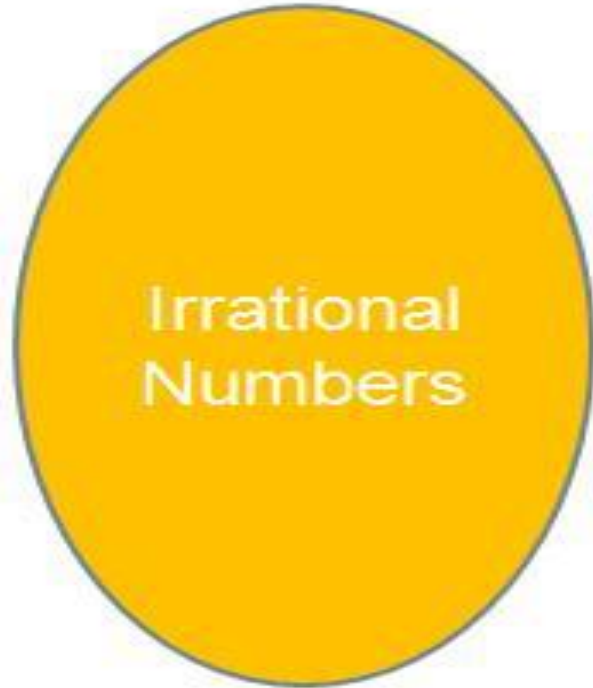
## 3.1C Compare and Order Rational Numbers

- I can compare and order rational numbers.

# RATIONAL NUMBERS

Numbers that can be written as a ratio of two integers

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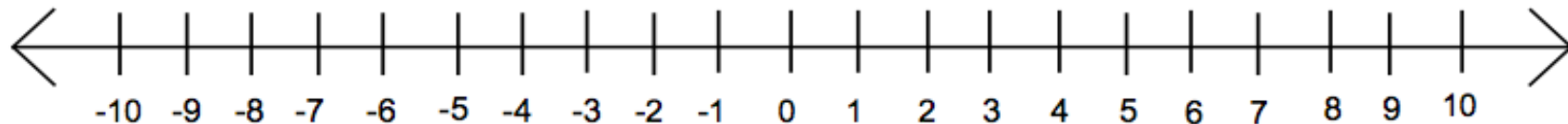
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# To Compare Rational Numbers: graph on a number line

Fill in the Blank with  $<$ ,  $>$ , or  $=$  to make a true sentence.

$$-3\frac{3}{8} \quad \underline{\hspace{2cm}} \quad -3\frac{7}{8}$$

$$\frac{3}{4} \quad \underline{\hspace{2cm}} \quad \frac{4}{5}$$



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# Convert Percents to Decimals:

- Remove the percent sign
- Move the decimal point two places to the left, adding zeros if necessary
- Example: convert 20% to a decimal

Example: List the numbers  $\frac{7}{10}$ ,  $0.6$ ,  $0.\overline{72}$  and  $\frac{16}{25}$  in order from least to greatest.



# Common Conversions



# Homework:

p.136 #8-27



## 3.2A Add and Subtract Like Fractions

- I can add and subtract fractions with like denominators.

**Like Fractions:** fractions that have the same denominators

- Examples: Add. Write in simplest form.

$$\frac{7}{12} + \frac{4}{12}$$

$$-\frac{4}{6} + \left(-\frac{1}{6}\right)$$

# Examples:

$$\frac{7}{9} - \frac{1}{9}$$

$$-\frac{7}{10} - \frac{2}{10}$$

$$\frac{3}{12} - \frac{9}{12}$$



# Homework:

p.142 #9-20, 24-29

## 3.2C Add and Subtract Unlike Fractions

- I can add and subtract fractions with unlike denominators.

7.NS.1, 7.NS.1b, 7.NS.1c, 7.NS.3 7.EE.3

# Unlike Fractions: fractions with different denominators

- If you have different denominators, have to make equivalent fractions that do have a common denominator

# Steps to Add/Subtract Unlike Fractions:

- 1) Rename the fractions using the least common denominator (LCD)
- 2) Add or subtract as with like fractions
- 3) Simplify if needed

# Examples:

$$\frac{3}{4} + \frac{1}{5}$$

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



Real World Example: A bucket was  $\frac{7}{8}$  full with soapy water. After washing the car, the bucket was only  $\frac{1}{4}$  full. What part of the water was used?



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# Homework:

p.149 #11-22, 27-34, 37-40

## 3.2D Add and Subtract Mixed Numbers

- I can add and subtract mixed numbers.

## Examples:

$$3\frac{1}{12} + 14\frac{7}{12}$$


$$9\frac{7}{10} - 4\frac{3}{5}$$

# Rename Mixed Numbers to Subtract

Method 1: Rename

$$8\frac{1}{5} - 3\frac{3}{5}$$

Method 2: use improper fractions


$$11 - 8\frac{2}{3}$$



# Homework:

p.155 #11-33 odd, 34, 35, 37

## 3.3B Multiply Fractions

- I can multiply fractions and mixed numbers.



Multiply the numerators

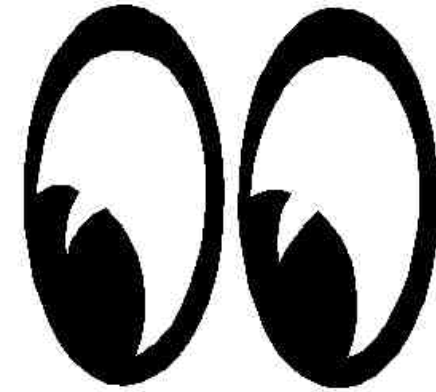
$$\frac{2}{5} \times \frac{3}{4} = \frac{6}{20}$$

Multiply the denominators

$$\frac{2}{5} \times \frac{3}{4} = \frac{6}{20}$$


Reduce the fraction if necessary

$$\frac{6}{20} = \frac{3}{10}$$



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**Look for cross  
cancelling  
to multiply smaller  
numbers**



# Examples:

**To multiply mixed numbers:** change to improper, then multiply

$$\frac{1}{3} \times 6\frac{6}{7}$$



# Homework:

p.163 #9-31 odd, 32, 39-45

## 3.3D Divide Fractions

- I can divide fractions and mixed numbers.

# Reciprocal (aka Multiplicative Inverse):

- A number multiplied by it's reciprocal equals 1.

Examples:

# To divide fractions:

- 1) Change to improper if there are mixed numbers
- 2) Change from dividing to multiplying by the reciprocal
- 3) Multiply
- 4) Simplify if needed

# Examples:

$$\frac{2}{3} \div \left( -\frac{4}{9} \right)$$

$$\frac{5}{6} \div 2\frac{1}{2}$$



**Real World Example:** Students are making butterfly houses. The side pieces of the house need to be  $8 \frac{1}{4}$  inches long. How many side pieces can be cut from a board measuring  $49 \frac{1}{2}$  inches long?



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# Homework:

p.171 #11-35 odd, 36-42



# Chapter Test