3.1 - What's a Rational Number?

September 4, 2019   4:06 PM

Math 9   Name: _____ Block:_____

Chapter 3: Rational Numbers

Topic	Assignment	Completed?
3.1: What's a Rational Number?	Pg. 101. #6-11, 12adf, 13, 17, 22	
3.2 & 3.3: Adding and Subtracting Rational Numbers	Pg. 111 # 3-5, 9, 11 **AND** Pg. 119 # 3, 9, 11	
3.4 & 3.5: Multiplying and Dividing Rational Numbers	Pg. 127 # 4, 5, 7, 10 **AND** Pg. 134 # 4, 5, 11 (#11 with a calculator)	
3.6: Order of Operations with Rational Numbers	Pg. 140 # 4, 7, 10, 11, 17	

Math 9

3.1 What is a Rational Number?

Example 1: Compare and Order Rational Numbers

Compare and order the following rational numbers.

$$-1.2 \qquad \frac{4}{5} \qquad \frac{7}{8} \qquad -0.\overline{5} \qquad -\frac{7}{8}$$

Solution: $= 0.5555....$

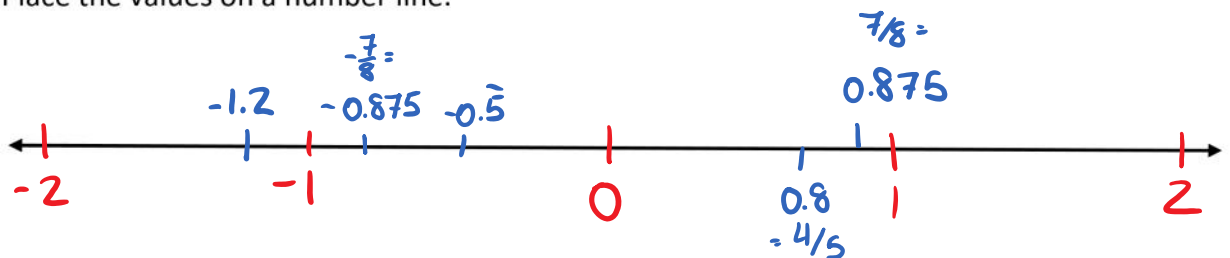| **rational number** |
| :--- |
| • a number that can be expressed as $\frac{a}{b}$, where a and b are integers and $b \neq 0$ |
| • examples include -4, 3.5, $-\frac{1}{2}$, $1\frac{3}{4}$, and 0 |

Express all of the numbers in the same form. We can use decimal form via a calculator.

$$\frac{4}{5} = 0.8 \qquad \frac{-7}{8} = -0.875$$

$$\frac{7}{8} = 0.875$$

Place the values on a number line.

Write the numbers in ascending order:

$$-1.2 , \ -\frac{7}{8} , \ -0.\overline{5} , \ 4/5 , \ ^7\!/_8$$

Write the numbers in descending order:

$$^7\!/_8 , \ 4/5 , \ -0.\overline{5} , \ -^7\!/_8 , \ -1.2$$

Math 9

Compare the following rational numbers. Write them in ascending order and descending order.

$0.\overline{3}$ -0.6 $-\dfrac{3}{4}$ $1\dfrac{1}{5}$ -1

$1\dfrac{1}{5}$

$1 \times 5 = 5$

$5 + 1 = 6$

$\Rightarrow \dfrac{6}{5} = 1.2$

*Keep the same denominator

$0.\overline{3}, -0.6, -0.75, 1.2, -1$

Ascending:

$-1, -0.75, -0.6, 0.\overline{3}, 1.2$

$\Rightarrow -1, -\dfrac{3}{4}, -0.6, 0.\overline{3}, 1\dfrac{1}{5}$

Example 2: Compare Rational Numbers

Which fraction is greater, $-\dfrac{3}{4}$ or $-\dfrac{2}{3}$?

Solution:

<u>Method 1: Use Equivalent Fractions</u>

Express the fractions as equivalent fractions with common denominators.

LCD (lowest common denominator) = __12__

Denominators: 3 ; 4

3: 3, 6, 9, 12, 15, ...
4: 4, 8, 12, 16, 20, ...

$\dfrac{-3 \times 3}{4 \times 3} = \dfrac{-9}{12}$

$\dfrac{-2 \times 4}{3 \times 4} = \dfrac{-8}{12}$

When the denominators are the same, compare the numerators.

$\dfrac{-3}{4} = \dfrac{-9}{12}$

$\dfrac{-2}{3} = \dfrac{-8}{12}$ → Larger.

∴ $-\dfrac{2}{3}$ is larger than $-\dfrac{3}{4}$.

Math 9

Method 2: Use Decimals

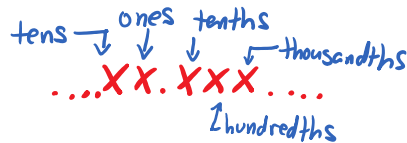Compare the numbers by writing each fraction as a decimal.

> **Show You Know**
>
> Which fraction is smaller, $-\frac{7}{10}$ or $-\frac{3}{5}$?

$$\frac{-7}{10} = \boxed{0.7} \quad \rightarrow \text{smaller.}$$
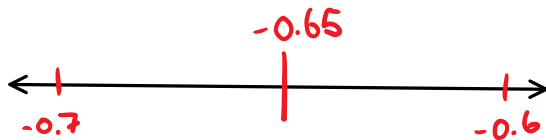
$$\frac{-3}{5} = -0.6$$

Example 3: Identify a Rational Number Between Two Given Rational Numbers

Identify a fraction between -0.6 and -0.7.

tens $\rightarrow$ ones tenths
$$\ldots XX \cdot XXX \ldots \quad \text{thousandths}$$
hundredths

Solution:

Identify a decimal between -0.6 and -0.7, we'll need to go in to the hundredths place value.

$$-0.65$$

$\longleftarrow \quad | \quad \quad | \quad \quad | \longrightarrow$

-0.7   -0.6

Convert the decimal to a fraction.

-0.65

↑

ends in the "hundredths" So, put it over 100.

$$\rightarrow \frac{-65}{100} \overset{\div 5}{\underset{\div 5}{=}} \boxed{\frac{-13}{20}}$$

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Textbook Assignment: Pg. 101. #6-11, 12adf, 13, 17, 22