

Unit 3
Rational Numbers
Mini Lessons
Week #4

Mini Lesson #1 **Nov. 2nd, 2020**

Oct. 11, 2018

For Tasks #2 & 3

1. Comparing & ordering rational numbers
2. Placing decimals and fractions on a number line

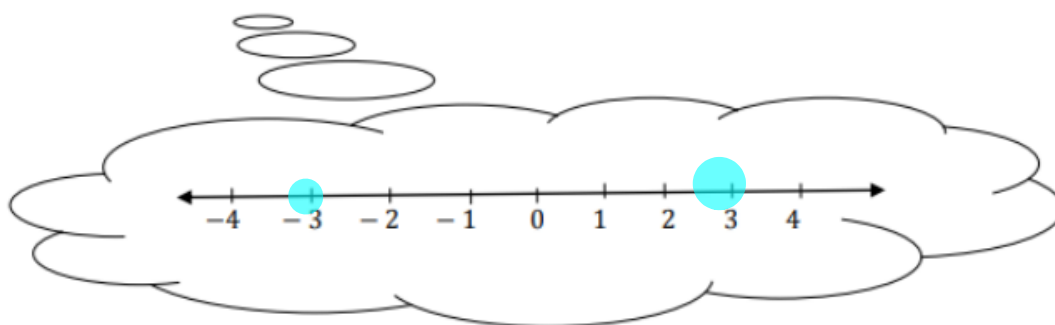
Grade 9 Math

Unit 3: Rational Numbers

Section 3.1: What is a Rational Number?

Integers, I , is a set of numbers that include positive and negative numbers and zero.

Imagine a number line



Rational Numbers, Q , is any number that can be written in the form, $\frac{m}{n}$, where m and n are both integers but $n \neq 0$.

Example: Using any two integers create a fraction and change to a decimal.

- 1a). $\frac{-6}{3} = \frac{-2}{1} = -2$ *** notice -2 is an integer and a rational number.
 *** any integer can be written as a fraction using 1 as the denominator.
- b). $\frac{2}{3} = 0.\bar{6}$ *** $0.\bar{6}$ is a repeating decimal and a rational number.
- c). $\frac{7}{8} = 0.875$ *** 0.875 is a terminating decimal and a rational number.
- d). $\frac{100}{25} = 4$ *** 4 is an integer and a rational number.

Therefore, rational numbers include all integers, fractions, terminating decimals and repeating decimals.

2. Identify the rational numbers below:

a). $\frac{-1}{4} \longrightarrow$ Rational. It's a fraction. Even as a terminating decimal, -0.25 it's still rational.

b). $\sqrt{9} \longrightarrow$ is 3. Rational. 3 is an integer.

c). $\frac{-4}{-9} \longrightarrow \frac{4}{9}$ is rational, it's a fraction. Even as a repeating decimal, $0.\overline{4}$ it's still rational.

d). $\sqrt{75} \longrightarrow = 8.660254038\dots$

e). $\pi \longrightarrow = 3.1415926535\dots$

} These numbers are non-repeating and non-terminating decimals.

} These types of numbers are called **irrational numbers**, \bar{Q} .

Compare and Order Rational Numbers

1. Use $>$, $<$, or $=$ to determine which rational number is greater, where possible.

a). $\frac{4}{7} > \frac{5}{9}$

* use a common denominator
...63

$$\frac{4 \times 9}{7 \times 9} \quad \frac{5 \times 7}{9 \times 7}$$

$$\frac{36}{63} > \frac{35}{63}$$



* Larger numerator represents the greater fraction.

b). $\frac{-3}{8} > \frac{-5}{8}$ ■

* already has a common denominator so look at the numerators.

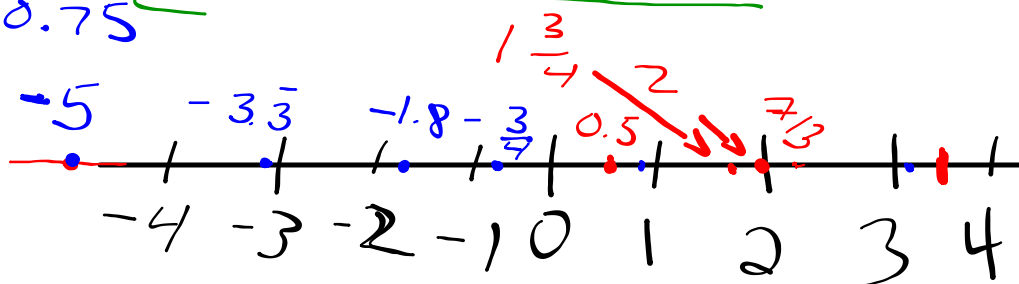
With negative numbers closer to zero is greater,

since $-3 > -5$ then $\frac{-3}{8} > \frac{-5}{8}$

<p>c). $\frac{2}{7} > \frac{2}{9}$</p> <p>* for two positive fractions which have common numerators, the smallest denominator is the greater fraction.</p>	<p>d). $\frac{-2}{7} < \frac{-2}{9}$ </p> <p>* for negative fractions which have common numerators, the larger denominator is the greater fraction.</p>
<p>e). $\frac{-3}{4} < \frac{3}{4}$</p> <p>* positive is always greater than negative.</p> <p>* these fractions are called opposites.</p> <p>For every positive fraction, or decimal, there is a corresponding negative fraction or decimal.</p> <p>($\frac{2}{5}$ and $\frac{-2}{5}$ are opposites)</p> <p>(0.25 and -0.25 are opposites).</p>	<p>f). $\frac{-10}{4} > -2.8$ </p> <p>* change $\frac{-10}{4}$ to a decimal or change -2.8 to a fraction.</p> $\frac{-10}{4} \rightarrow \begin{array}{r} 2.5 \\ 4 \overline{)10.0} \\ \underline{-8} \\ 20 \\ \underline{-20} \\ 0 \end{array}$ <p style="text-align: right;">-2.5</p> <p>And $-2.5 > -2.8$</p>
<p>g). $\frac{-7}{8} = \frac{7}{-8}$ * Regardless of the position of the negative sign, these fractions are equal. A positive divided by a negative is always negative.</p> $\frac{-7}{8} = \frac{7}{-8} = -\frac{7}{8}$	

2. Place these rational numbers in descending order.

$\frac{-3}{4}$ ✓, 0.5 ✓, -1.8 ✓, -5 ✓, $\frac{7}{3}$ ✓, 2 ✓, $-3.\bar{3}$ ✓, $1\frac{3}{4}$ ✓
 $\frac{+3}{4}$
 0.75



Descending Order (from largest to smallest)

$\frac{7}{3}$, 2 , $1\frac{3}{4}$, 0.5 , $\frac{-3}{4}$, -1.8 , $-3.\bar{3}$, -5

Writing a Rational Number between two given numbers.

Think opposites

1. Identify a decimal between each pair of rational numbers.

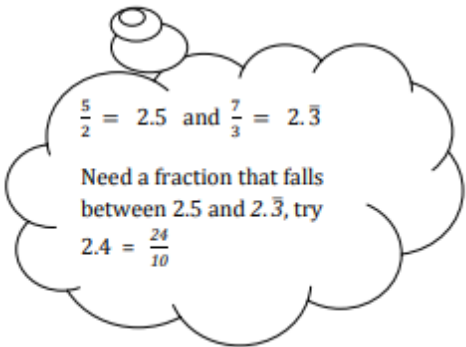
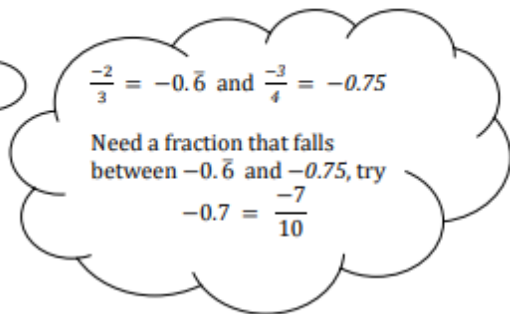
a). $\frac{-1}{2}$ and $\frac{-1}{4} \longrightarrow -0.3$

b). -0.25 and $-0.26 \longrightarrow -0.255$

2. Identify a fraction between each pair of rational numbers.

a). $\frac{-2}{3}$ and $\frac{-3}{4} \longrightarrow \frac{-7}{10}$

b). $\frac{5}{2}$ and $\frac{7}{3} \longrightarrow \frac{24}{10} = \frac{12}{5}$



End of Mini Lesson #1