2.1 Rational Numbers

EQ: How can we compare and order rational numbers?

Rational Numbers: any number that can be written as a fraction.

EX: 1.5, 4, $\frac{-3}{2}$, -7, $-1\frac{3}{4}$, etc.

Example 1: Fraction → Decimal

$-2\frac{1}{4}$ → -2.25 or $-\frac{9}{4}$

$4\overline{)1.00}$ → $.25$

-8, 20, -20, 0

$-2\frac{1}{4}$ → -2.25

$4\overline{)9.00}$ → -2.25

-8, 10, -8, 20, -20, 0

$-2\frac{1}{4} \times \frac{25}{25} = -2\frac{25}{100} = -2.25$

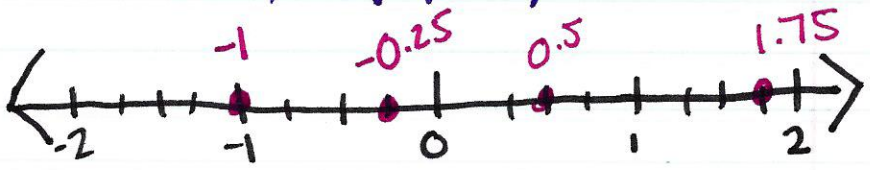
Convert
* number has the same value
* keep the same sign

Example 2: Decimal → Fraction

$-0.26 = \frac{-26}{100} \div \frac{2}{2} = \frac{-13}{50}$

Example 3: order from least to greatest

$-0.25, -1, 1.75, 0.5$



$-1, -0.25, 0.5, 1.75$

Summary:

2.2 Adding Rational Numbers

EQ: How can we use what we know about adding integers to add rational numbers?

* We use the same rules as adding integers when we add rational numbers.

Example 1: $-\frac{8}{3} + \frac{5}{6}$ $\left(\times 2, \times 2\right)$

$\frac{-16}{6} + \frac{5}{6}$

$-16 + 5 = -11$

$= \frac{-11}{6}$

$6\overline{)11}$ R 5

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

* different signs
* common denominator

Example 2: $-4.05 + 7.62$

* Line up the decimals
* Different signs

7.62
-4.05
3.57

$= 3.57$

Example 3: Evaluate $2xty$ when $x = \frac{1}{4}$, $y = \frac{-3}{2}$

$2\left(\frac{1}{4}\right) + \left(\frac{-3}{2}\right)$

$\frac{1}{2} + \frac{-3}{2}$

$1 + (-3) = -2$

$= \frac{-2}{2} = -1$

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

$= \frac{1}{2}$

Summary:

2.3 Subtracting Rational Numbers

EQ: How can we use what we know about subtracting integers to subtract rational numbers?

* subtracting rational numbers has the same rules as subtracting integers.
(ex: "boom boom" "keep change take the opposite")
turn into an addition problem

Example 1: $-4\frac{1}{7} \div \left(+\frac{6}{7}\right)$ "BOOM BOOM"

* change to an addition problem

* Keep change take the opposite

$= -4\frac{1}{7} + \left(\frac{6}{7}\right)$

$= \frac{-29}{7} + \frac{6}{7}$

different signs

$= \frac{-29+6}{7}$

$= \frac{-23}{7} = -3\frac{2}{7}$

$7\overline{)23}$ R 2

Example 2: $12.8 \div -21.6$ "BOOM BOOM"

* Keep change take the opposite

* change to an addition problem
* Line up the decimals

$12.8 + (-21.6)$

greatest absolute value

Different signs

$$\begin{array}{r} 12\overset{1}{1}.\overset{1}{1}\overset{1}{6} \\ -\ 12.8 \\ \hline 8.8 \end{array}$$

$= -8.8$

Summary:

2.4 Multiplying and Dividing Rational Numbers

EQ: How can we use what we know about multiplying and dividing integers to multiply and divide rational numbers?

*Multiplying and dividing rational numbers uses the same rules as multiplying and dividing integers.

Example 1: $\frac{5}{6} \times \left(-\frac{8}{15}\right)$ (÷5 on 5, ÷2 on 6, ÷2 on −8, ÷5 on 15)

pos. × neg. = neg.

$\frac{1}{3} \times \left(-\frac{4}{3}\right) = \frac{-4}{9}$

Example 2: $-2\frac{4}{5} \div (-7)$

neg ÷ neg = pos.

*Keep Change Flip

$\frac{-14}{5} \div \frac{-7}{1}$

$\frac{-14}{5} \times \frac{1}{-7}$ (÷7 on −14 and −7)

$\frac{-2}{5} \times \frac{1}{-1} = \frac{-2}{-5} = \frac{2}{5}$

Example 3: $-8 \div 2.2$

neg ÷ pos = neg.

needs a to be whole number

$2.2\overline{)8.0}$

$\times 3.\overline{63}$

$22\overline{)80.00}$

-66

140

-132

80

-66

14

$= -3.\overline{63}$