Lesson 9: Applying the Properties of Operations to Add and Subtract Rational Numbers

Classwork

Exercise 1

Unscramble the cards, and show the steps in the correct order to arrive at the solution to $5\frac{2}{9} - \left(8.1 + 5\frac{2}{9}\right)$.

$0 + (-8.1)$

$\left(5\frac{2}{9} + \left(-5\frac{2}{9}\right)\right) + (-8.1)$

-8.1

$5\frac{2}{9} + \left(-8.1 + \left(-5\frac{2}{9}\right)\right)$

$5\frac{2}{9} + \left(-5\frac{2}{9} + (-8.1)\right)$

Examples 1 and 2

Represent each of the following expressions as one rational number. Show your steps.

1. $4\frac{4}{7} - \left(4\frac{4}{7} - 10\right)$

2. $5 + \left(-4\frac{4}{7}\right)$

Exercise 2: Team Work!

a. $-5.2-(-3.1)+5.2$

c. $32+\left(-12\frac{7}{8}\right)$

b. $3\frac{1}{6}+20.3-\left(-5\frac{5}{6}\right)$

d. $\frac{16}{20}-(-1.8)-\frac{4}{5}$

Exercise 3

Explain step by step, how to arrive at a single rational number to represent the following expression. Show both a written explanation and the related math work for each step.

$$-24-\left(-\frac{1}{2}\right)-12.5$$

Lesson Summary

- Use the properties of operations to add and subtract rational numbers more efficiently. For instance:

  $-5\frac{2}{9}+3.7+5\frac{2}{9}=\left(-5\frac{2}{9}+5\frac{2}{9}\right)+3.7=0+3.7=3.7.$

- The opposite of a sum is the sum of its opposites as shown in the examples that follow:

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

  $-(5+3)=-5+(-3).$

Problem Set

Show all steps taken to rewrite each of the following as a single rational number.

1. $80+\left(-22\frac{4}{15}\right)$

2. $10+\left(-3\frac{3}{8}\right)$

3. $\frac{1}{5}+20.3-\left(-5\frac{3}{5}\right)$

4. $\frac{11}{12}-(-10)-\frac{5}{6}$

5. Explain step by step, how to arrive at a single rational number to represent the following expression. Show both a written explanation and the related math work for each step.

$$1-\frac{3}{4}+\left(-12\frac{1}{4}\right)$$