

**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**

1. Represent each sum as a single rational number.

a.  $-14 + \left(-\frac{8}{9}\right)$

b.  $7 + \frac{1}{9}$

c.  $-3 + \left(-\frac{1}{6}\right)$

Rewrite each of the following to show that *the opposite of a sum is the sum of the opposites*. Problem 2 has been completed as an example.

2.  $-(9 + 8) = -9 + (-8)$   
 $-17 = -17$

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

4.  $-(10 + (-6))$

5.  $-\left((-55) + \frac{1}{2}\right)$

Use your knowledge of rational numbers to answer the following questions.

6. Meghan said the opposite of the sum of  $-12$  and  $4$  is  $8$ . Do you agree? Why or why not?
7. Jolene lost her wallet at the mall. It had  $\$10$  in it. When she got home, her brother felt sorry for her and gave her  $\$5.75$ . Represent this situation with an expression involving rational numbers. What is the overall change in the amount of money Jolene has?
8. Isaiah is completing a math problem and is at the last step:  $25 - 28\frac{1}{5}$ . What is the answer? Show your work.

9. A number added to its opposite equals zero. What do you suppose is true about *a sum added to its opposite*?  
Use the following examples to reach a conclusion. Express the answer to each example as a single rational number.

a.  $(3 + 4) + (-3 + -4)$

b.  $(-8 + 1) + (8 + (-1))$

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