

Operations with Rational Numbers

To add, subtract, multiply, or divide rational numbers, use the same rules for signs as you used for integers.

Example 1 Find (a) $-\frac{5}{6} + \frac{2}{3}$ and (b) $7.3 - (-4.8)$.

a. Write the fractions with the same denominator, then add.

$$-\frac{5}{6} + \frac{2}{3} = -\frac{5}{6} + \frac{4}{6} = \frac{-5 + 4}{6} = \frac{-1}{6} = -\frac{1}{6}$$

b. To subtract a rational number, add its opposite.

$$7.3 - (-4.8) = 7.3 + 4.8 = 12.1 \quad \text{The opposite of } -4.8 \text{ is } 4.8.$$

Example 2 Find (a) $2.25 \cdot 8$, (b) $-2.25 \cdot (-8)$, and (c) $-2.25 \cdot 8$.

a. $2.25 \cdot 8 = 18$

b. $-2.25 \cdot (-8) = 18$

c. $-2.25 \cdot 8 = -18$

Example 3 Find $-\frac{4}{9} \div \frac{3}{4}$.

To divide by a fraction, multiply by its reciprocal.

$$-\frac{4}{9} \div \frac{3}{4} = -\frac{4}{9} \cdot \frac{4}{3} = \frac{-4 \cdot 4}{9 \cdot 3} = -\frac{16}{27} \quad \text{The reciprocal of } \frac{3}{4} \text{ is } \frac{4}{3}.$$

Practice

Check your answers at BigIdeasMath.com.

Add, subtract, multiply, or divide.

1. $-7.5 + 3.8$

2. $-18.3 + (-6.7)$

3. $0.6 - 0.85$

4. $6.13 - (-2.82)$

5. $-6 \cdot 4.75$

6. $-3.2 \cdot (-4.8)$

7. $-1.8 \div (-9)$

8. $3.6 \div (-1.5)$

9. $-\frac{1}{6} + \frac{5}{6}$

10. $-\frac{7}{10} + \left(-\frac{3}{5}\right)$

11. $\frac{4}{9} - \frac{2}{3}$

12. $-\frac{5}{6} - \frac{1}{4}$

13. $-\frac{3}{2} \cdot \left(-\frac{1}{8}\right)$

14. $-\frac{3}{4} \cdot \frac{7}{12}$

15. $\frac{5}{8} \div \left(-\frac{1}{4}\right)$

16. $-\frac{4}{7} \div \frac{2}{5}$

17. **TEMPERATURE** The temperature at midnight is shown. The outside temperature decreases 2.3°C over the next two hours. What is the outside temperature at 2 A.M.?

18. **SNOWFALL** In January, a city's snowfall was $\frac{5}{8}$ foot below the historical average. In February, the snowfall was $\frac{3}{4}$ foot above the historical average. Was the city's snowfall in the two-month period above or below the historical average? By how much?

