

**Chapter Learning Target:** Understand operations with rational numbers.

**Chapter Success Criteria:**

- ◆ I can add and subtract rational numbers.
- ◆ I can multiply and divide rational numbers.
- I can convert between fractions and decimals.
- I can evaluate expressions involving rational numbers to solve real-life problems.

◆ Surface  
■ Deep

Rate your understanding after each section.

1 I don't understand yet.

2 I can do it with help.

3 I can do it on my own.

4 I can teach someone else.

## 2.1

### Adding Rational Numbers (pp. 73–86)

**Learning Target:** Find sums of rational numbers.

Find the sum. Write fractions in simplest form.

1.  $-11 + 8$  2.  $-4\frac{5}{9} + \frac{8}{9}$  3.  $-1.6 + (-2.4)$
- $-3$   $-3\frac{2}{3}$   $-4$
4. Find the sum of  $-4 + 6\frac{2}{5} + (-2.7)$ . Explain each step.

$-0.3$

Date	Amount (dollars)
3/5	100
3/12	-12.25
3/16	25.82
3/21	14.95
3/29	-18.56

5. You open a new bank account. The table shows the activity of your account for the first month. Positive numbers represent deposits, and negative numbers represent withdrawals. What is your balance (in dollars) in the account at the end of the first month?

$\$109.96$

## 2.2

### Subtracting Rational Numbers (pp. 87–100)

**Learning Target:** Find differences of rational numbers and find distances between numbers on a number line.

Find the difference. Write fractions in simplest form.

6.  $35 - 12$  7.  $\frac{5}{12} - \frac{3}{10}$  8.  $3.8 - (-7.45)$
- $23$   $-\frac{43}{60}$   $11.25$

Find the distance between the two numbers on a number line.

9. 7 and 18 10.  $-3.71$  and  $-2.59$  11.  $-3\frac{1}{4}$  and  $7\frac{1}{8}$
- $11$   $1.12$   $10\frac{3}{8}$

12. A turtle is  $20\frac{5}{6}$  inches below the surface of a pond. It dives to a depth of  $32\frac{1}{4}$  inches. What is the change in the turtle's position?

$20\frac{5}{6} - 32\frac{1}{4} = -11\frac{5}{12}$

13. The lowest temperature ever recorded on Earth was  $-89.2^\circ\text{C}$  at Soviet Vostok Station in Antarctica. The highest temperature ever recorded was  $56.7^\circ\text{C}$  at Greenland Ranch in California. What is the difference between the highest and lowest recorded temperatures?

$-89.2 - 56.7 = -145.9^\circ$





## 2.3

## Converting between Fractions and Decimals

(pp. 101–110)

**Learning Target:** Convert between different forms of rational numbers.

Write the fraction or mixed number as a decimal.

14.  $-\frac{8}{15}$

$-0.5\bar{3}$

15.  $\frac{5}{8}$

0.625

16.  $-\frac{13}{6}$

$-2.\bar{16}$

17.  $1\frac{7}{16}$

1.4375

Write the decimal as a fraction or mixed number in simplest form.

18.  $-0.6$

$-\frac{6}{10} = \left(\frac{-3}{5}\right)$

19.  $-0.35$

$-\frac{35}{100} = \left(\frac{-7}{20}\right)$

20.  $-5.8$

$-5\frac{8}{10}$

$-5\frac{4}{5}$

21. 24.23

$24\frac{23}{100}$

22. The table shows the changes in the average yearly precipitation (in inches) in a city for several months. Order the numbers from least to greatest.

February	March	April	May
-1.75	$\frac{3}{11}$	0.3	$-1\frac{7}{9}$

0. $\bar{27}$

$-1.\bar{7}$

$-1\frac{7}{9}, -1.75, \frac{3}{11}, 0.3$



## 2.4

# Multiplying Rational Numbers

(pp. 111–122)

**Learning Target:** Find products of rational numbers.

Find the product. Write fractions in simplest form.

23.  $-15 \cdot 3$

$-45$

24.  $6(-8)$

$-48$

25.  $9 \cdot (-7)$

$-63$

26.  $-\frac{4}{9}\left(-\frac{7}{9}\right)$

$\frac{28}{81}$

27.  $\frac{8}{15}\left(-\frac{2}{3}\right)$

$-\frac{16}{45}$

28.  $-5.9(-9.7)$

$57.23$

29.  $4.5(-5.26)$

$-23.67$

30.  $-\frac{2}{3}\left(2\frac{1}{2}\right)(-3)$

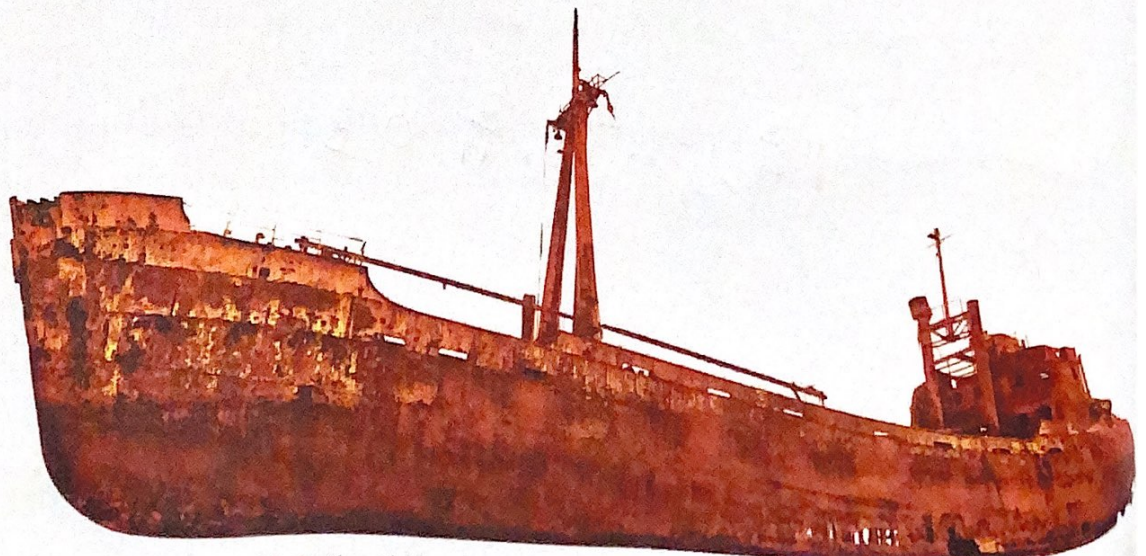
$5$

31.  $-1.6(0.5)(-20)$

$16$

32. The elevation of a sunken ship is  $-120$  feet. You are in a submarine at an elevation that is  $\frac{5}{8}$  of the ship's elevation. What is your elevation?

33. Write two fractions whose product is between  $\frac{1}{5}$  and  $\frac{1}{2}$ , and whose sum is negative.





## 2.5

## Dividing Rational Numbers (pp. 123-134)

Learning Target: Find quotients of rational numbers.

Find the quotient. Write fractions in simplest form.

34.  $-20 \div 4$

$-5$

35.  $56 \div (-8)$

$-7$

36.  $\frac{-63}{-9}$

$7$

37.  $\frac{9}{10} \div \left(-\frac{6}{5}\right)$

$-\frac{3}{4}$

38.  $-\frac{4}{11} \div \frac{2}{7}$

$-1\frac{3}{11}$

39.  $-15.4 \div (-2.5)$

$6.16$

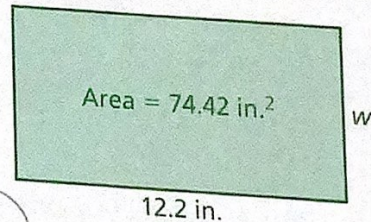
40. Write two rational numbers whose quotient is greater than one.

41. Find the missing side length of the rectangle.

$A = l \cdot w$

$74.42 = 12.2 \cdot w$

$74.42 \div 12.2 = 6.1 \text{ in}$



42. You use a debit card to purchase several shirts. Your account balance after buying the shirts changes by  $-\$30.60$ . For each shirt you purchased, the change in your account balance was  $-\$6.12$ . How many shirts did you buy?



## 2.6

## Using Rational Number Operations (pp. 135–144)

**Learning Target:** Apply the order of operations to expressions involving rational numbers.

Evaluate the expression. Write fractions in simplest form.

43.  $(0.2)^3 + 1.28$

$$0.008 + 1.28$$

$$1.288$$

44.  $\frac{2}{3} + \left(\frac{1}{6} \div \frac{1}{2}\right) - \frac{1}{3}$

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

$$\frac{2}{3}$$

45.  $|(-1.4)^3 - 1.28|$

$$-2.744 - 1.28$$

$$4.024$$

46.  $-\frac{1}{3} \cdot \frac{3}{8} - \frac{1}{4}$

$$-\frac{1}{8} - \frac{1}{4}$$

$$-\frac{3}{8}$$

47.  $-5.42 + (-2.46 \cdot 3)$

$$-5.42 + (-7.38)$$

$$-12.8$$

48.  $\frac{|-56 + 24|}{8}$

$$\frac{32}{8}$$

$$4$$

49. At the store, pears cost \$1.10 per pound, and a pack of gum costs \$1.32. You have \$8.50 and want to purchase 3.2 pounds of pears and a pack of gum. Do you have enough money to buy another pack of gum? Explain.

50. A researcher predicted that a water snake would grow about  $1\frac{2}{5}$  centimeters per year. The snake grew  $1\frac{7}{10}$  centimeters the first year,  $\frac{4}{5}$  times the researcher's prediction the second year, and  $1\frac{2}{7}$  centimeters the third year. Was the researcher's prediction less than or greater than the snake's actual growth for the three-year period?

