

# Section Overview



## Writing and Evaluating Algebraic Expressions

Lessons 1-1, 1-2

**Why?** Formulas are written using algebraic expressions that show relationships between quantities. When you evaluate these algebraic expressions, you get a value for the formula.

The **perimeter** of a rectangle is the **sum** of **twice the length** and **twice the width**.  
 $P = 2l + 2w$

**Find the perimeter of a rectangle with length 3 inches and width 4 inches.**

$$\begin{aligned} P &= 2l + 2w \\ &= 2(3) + 2(4) \\ &= 6 + 8 \\ &= 14 \end{aligned}$$

The perimeter is 14 inches.

To **evaluate** an algebraic expression, **substitute** a given number for the variable, and find the value of the resulting numerical expression.

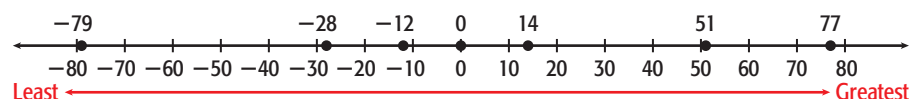
## Integers and Absolute Value

Lesson 1-3

**Why?** Many real-world situations involve integers and absolute value.

The **integers** are the set of whole numbers and their **opposites**.

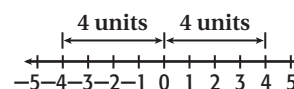
To order the integers  $-12$ ,  $14$ ,  $-28$ ,  $77$ ,  $0$ ,  $51$ , and  $-79$  from least to greatest, consider their relative positions on a number line.



The numbers written from least to greatest are  $-79$ ,  $-28$ ,  $-12$ ,  $0$ ,  $14$ ,  $51$ , and  $77$ .

Both 4 and  $-4$  are 4 units from 0.

$$|4| = 4 \text{ and } |-4| = 4$$



The **absolute value** of an integer is the integer's distance from zero on a number line.

## Integer Operations

Lessons 1-4, 1-5, 1-6

**Why?** To evaluate expressions, we need to be able to operate with integers.

| Adding Integers                                                                                                                               |                                                                                                                                                                       | Subtracting Integers                                                                              |                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------|
| <i>If the signs are the same ...</i>                                                                                                          | <i>If the signs are different ...</i>                                                                                                                                 | To subtract an integer, add its opposite.<br><br>$5 - 2 = 5 + (-2) = 3$<br>$5 - (-2) = 5 + 2 = 7$ |                     |
| Add the absolute values. The sign for the sum will be the same as the sign of the integers you are adding.<br>$5 + 2 = 7$<br>$-5 + (-2) = -7$ | Subtract the absolute values. The sign for the difference will be the same as that of the integer with the greater absolute value.<br>$5 + (-2) = 3$<br>$-5 + 2 = -3$ |                                                                                                   |                     |
|                                                                                                                                               |                                                                                                                                                                       |                                                                                                   |                     |
| Multiplying and Dividing Integers                                                                                                             |                                                                                                                                                                       |                                                                                                   |                     |
| <i>If the signs are the same ...</i>                                                                                                          |                                                                                                                                                                       | <i>If the signs are different ...</i>                                                             |                     |
| The sign of the product or quotient will be positive.                                                                                         |                                                                                                                                                                       | The sign of the product or quotient will be negative.                                             |                     |
| $6(2) = 12$                                                                                                                                   | $\frac{6}{2} = 3$                                                                                                                                                     | $6(-2) = -12$                                                                                     | $\frac{6}{-2} = -3$ |
| $-6(-2) = 12$                                                                                                                                 | $\frac{-6}{-2} = 3$                                                                                                                                                   | $-6(2) = -12$                                                                                     | $\frac{-6}{2} = -3$ |