

**1-4 Solving Absolute Value Equations****What You'll Learn**

Scan the text under the *Now* heading. List two things you will learn about in the lesson.

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_

**Active Vocabulary**

**Review Vocabulary** Describe the importance of grouping symbols to the order of operations. (*Lesson 1-1*)

---

---

---

---

**New Vocabulary** Fill in the blank with the correct term or phrase.

- absolute value* ▶ The \_\_\_\_\_ of a number from \_\_\_\_\_ on a number line.
- empty set* ▶ The term used to describe when an equation is \_\_\_\_\_ true and thus has no solution. The symbols used to denote the empty set are \_\_\_\_\_ and \_\_\_\_\_.
- extraneous solution* ▶ The term used to describe a solution to an \_\_\_\_\_ which is found when solving the equation but is determined to be invalid when \_\_\_\_\_ the solution in the original equation.

**Lesson 1-4** (continued)

**Main Idea**

**Details**

**Absolute Value Expressions**

p. 27

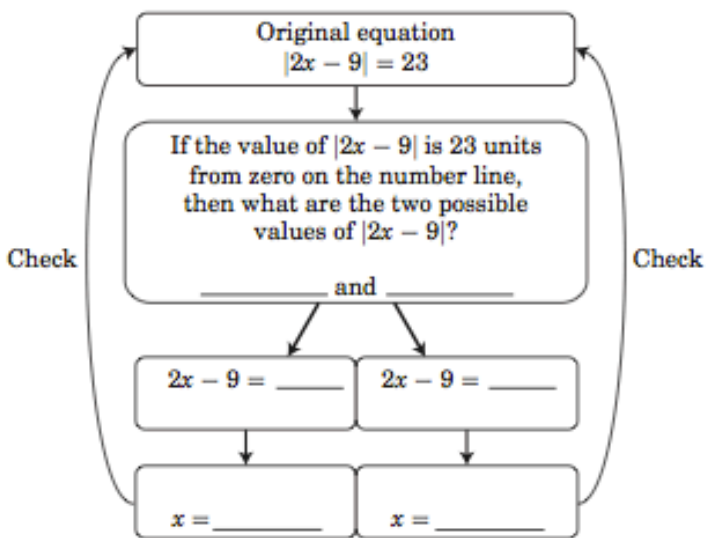
Evaluate each expression given  $u = -3$  and  $v = 5$ .

- |                       |                               |
|-----------------------|-------------------------------|
| 1. $ u - v $          | 2. $3 u  - 4 v $              |
| 3. $5 -  4u + 7  - v$ | 4. $\frac{ 2u - 1 }{ v - 6 }$ |

**Absolute Value Equations**

pp. 28–29

Complete the diagram to solve the equation  $|2x - 9| = 23$ .



**Helping You Remember**

How can the number line model for absolute value, shown in your textbook help you remember that many absolute value equations have two solutions?

---



---

**1-4 Skills Practice****Solving Absolute Value Equations**Evaluate each expression if  $w = 0.4$ ,  $x = 2$ ,  $y = -3$ , and  $z = -10$ .

1.  $|5w|$

2.  $|-9y|$

3.  $|9y - z|$

4.  $-|17z|$

5.  $-|10z - 31|$

6.  $-|8x - 3y| + |2y + 5x|$

7.  $25 - |5z + 1|$

8.  $44 + |-2x - y|$

9.  $2|4w|$

10.  $3 - |1 - 6w|$

11.  $|-3x - 2y| - 4$

12.  $6.4 + |w - 1|$

Solve each equation. Check your solutions.

13.  $|y + 3| = 2$

14.  $|5a| = 10$

15.  $|3k - 6| = 2$

16.  $|2g + 6| = 0$

17.  $10 = |1 - c|$

18.  $|2x + x| = 9$

19.  $|p - 7| = -14$

20.  $2|3w| = 12$

21.  $|7x - 3x| + 2 = 18$

22.  $4|7 - y| - 1 = 11$

23.  $|3n - 2| = \frac{1}{2}$

24.  $|8d - 4d| + 5 = 13$

25.  $-5|6a + 2| = -15$

26.  $|k| + 10 = 9$

**1-4 Practice****Solving Absolute Value Equations**Evaluate each expression if  $a = -1$ ,  $b = -8$ ,  $c = 5$ , and  $d = -1.4$ .

1.  $|6a|$

2.  $|2b + 4|$

3.  $-|10d + a|$

4.  $|17c| + |3b - 5|$

5.  $-6|10a - 12|$

6.  $|2b - 1| - |-8b + 5|$

7.  $|5a - 7| + |3c - 4|$

8.  $|1 - 7c| - |a|$

9.  $-3|0.5c + 2| - |-0.5b|$

10.  $|4d| + |5 - 2a|$

11.  $|a - b| + |b - a|$

12.  $|2 - 2d| - 3|b|$

Solve each equation. Check your solutions.

13.  $|n - 4| = 13$

14.  $|x - 13| = 2$

15.  $|2y - 3| = 29$

16.  $7|x + 3| = 42$

17.  $|3u - 6| = 42$

18.  $|5x - 4| = -6$

19.  $-3|4x - 9| = 24$

20.  $-6|5 - 2y| = -9$

21.  $|8 + p| = 2p - 3$

22.  $|4w - 1| = 5w + 37$

23.  $4|2y - 7| + 5 = 9$

24.  $-2|7 - 3y| - 6 = -14$

25.  $2|4 - s| = -3s$

26.  $5 - 3|2 + 2w| = -7$

27.  $5|2r + 3| - 5 = 0$

28.  $3 - 5|2d - 3| = 4$

**29. WEATHER** A thermometer comes with a guarantee that the stated temperature differs from the actual temperature by no more than 1.5 degrees Fahrenheit. Write and solve an equation to find the minimum and maximum actual temperatures when the thermometer states that the temperature is 87.4 degrees Fahrenheit.

**30. OPINION POLLS** Public opinion polls reported in newspapers are usually given with a margin of error. For example, a poll with a margin of error of  $\pm 5\%$  is considered accurate to within plus or minus 5% of the actual value. A poll with a stated margin of error of 63% predicts that candidate Tonwe will receive 51% of an upcoming vote. Write and solve an equation describing the minimum and maximum percent of the vote that candidate Tonwe is expected to receive.