

2 Solving Linear Inequalities

- 2.1 Writing and Graphing Inequalities
- 2.2 Solving Inequalities Using Addition or Subtraction
- 2.3 Solving Inequalities Using Multiplication or Division
- 2.4 Solving Multi-Step Inequalities
- 2.5 Solving Compound Inequalities
- 2.6 Solving Absolute Value Inequalities



Camel Physiology (p. 91)



Mountain Plant Life (p. 85)



Digital Camera (p. 70)



Natural Arch (p. 59)



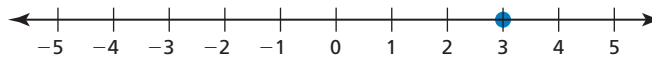
Microwave Electricity (p. 64)

Maintaining Mathematical Proficiency

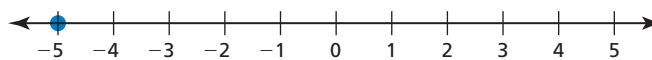
Graphing Numbers on a Number Line

Example 1 Graph each number.

a. 3



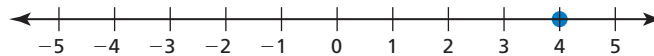
b. -5



Example 2 Graph each number.

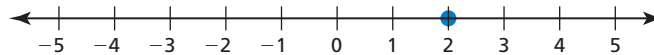
a. $|4|$

The absolute value of a positive number is positive.



b. $|-2|$

The absolute value of a negative number is positive.



Graph the number.

1. 6

2. $|2|$

3. $|-1|$

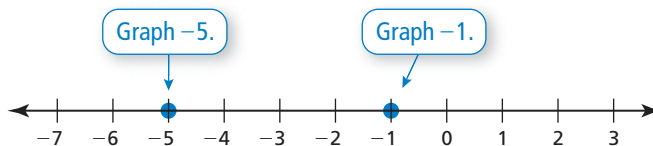
4. $2 + |-2|$

5. $1 - |-4|$

6. $-5 + |3|$

Comparing Real Numbers

Example 3 Complete the statement -1 -5 with $<$, $>$, or $=$.



▶ -1 is to the right of -5 . So, $-1 > -5$.

Complete the statement with $<$, $>$, or $=$.

7. 2 9

8. -6 5

9. -12 -4

10. -7 -13

11. $|-8|$ $|8|$

12. -10 $|-18|$

13. **ABSTRACT REASONING** A number a is to the left of a number b on the number line. How do the numbers $-a$ and $-b$ compare?

Mathematical Practices

Mathematically proficient students use technology tools to explore concepts.

Using a Graphing Calculator

Core Concept

Solving an Inequality in One Variable

You can use a graphing calculator to solve an inequality.

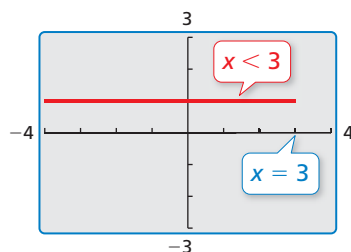
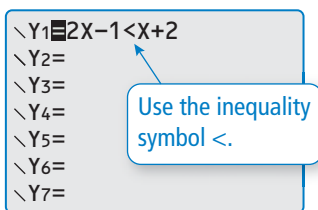
1. Enter the inequality into a graphing calculator.
2. Graph the inequality.
3. Use the graph to write the solution.

EXAMPLE 1 Using a Graphing Calculator

Use a graphing calculator to solve (a) $2x - 1 < x + 2$ and (b) $2x - 1 \leq x + 2$.

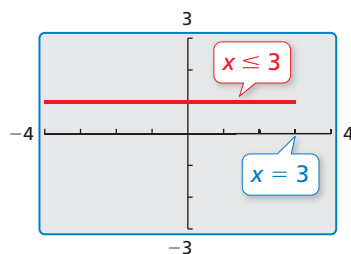
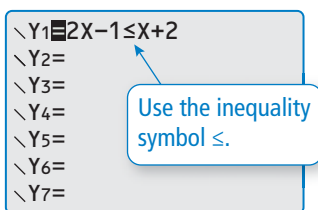
SOLUTION

- a. Enter the inequality $2x - 1 < x + 2$ into a graphing calculator. Press *graph*.



- ▶ The solution of the inequality is $x < 3$.

- b. Enter the inequality $2x - 1 \leq x + 2$ into a graphing calculator. Press *graph*.



- ▶ The solution of the inequality is $x \leq 3$.

Notice that the graphing calculator does not distinguish between the solutions $x < 3$ and $x \leq 3$. You must distinguish between these yourself, based on the inequality symbol used in the original inequality.

Monitoring Progress

Use a graphing calculator to solve the inequality.

1. $2x + 3 < x - 1$
2. $-x - 1 > -2x + 2$
3. $\frac{1}{2}x + 1 \leq \frac{3}{2}x + 3$