Name _____ Date _____

LESSON 5.1

Study Guide

For use with the lesson "Solve Inequalities Using Addition and Subtraction"

GOAL **Solve inequalities using addition and subtraction.**

Vocabulary

The **graph of an inequality** in one variable is the set of points that represent all solutions of the inequality.

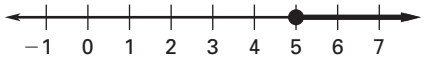
Equivalent inequalities are inequalities that have the same solutions.

EXAMPLE 1 Write and graph an inequality

You must be at least 5 years old to go to kindergarten in Pennsylvania. Use this fact to write and graph an inequality that describes the age requirement.

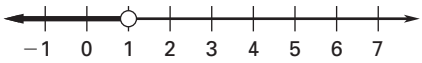
Solution

Let a represent the age in years. The value of a must be greater than or equal to 5. So, an inequality is $a \geq 5$.



EXAMPLE 2 Write an inequality from a graph

Write an inequality represented by the graph.



Solution

The open circle means that 1 is not a solution of the inequality. Because the numbers to the left of 1 are shaded, all numbers less than 1 are solutions.

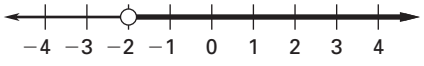
An inequality represented by the graph is $x < 1$.

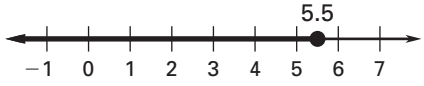
Exercises for Examples 1 and 2

Write and graph an inequality that describes the situation.

1. An infant car seat is designed for babies and toddlers weighing less than 40 pounds.
2. A sign on a store display says items are $4 or higher.

Write an inequality represented by the graph.

3. 

4. 

LESSON 5.1

Study Guide *continued*

For use with the lesson "Solve Inequalities Using Addition and Subtraction"

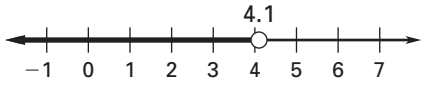
EXAMPLE 3 Solve an inequality using addition

Solve $x - 1.3 < 2.8$. Graph your solution.

Solution

$x - 1.3 < 2.8$	Write original inequality.
$x - 1.3 + 1.3 < 2.8 + 1.3$	Add 1.3 to each side.
$x < 4.1$	Simplify.

The solutions are all real numbers less than 4.1. Check by substituting a number less than 4.1 for x in the original inequality.



CHECK	$x - 1.3 < 2.8$	Write original inequality.
	$3 - 1.3 \stackrel{?}{<} 2.8$	Substitute 3 for x.
	$1.7 < 2.8$ ✓	Solution checks.

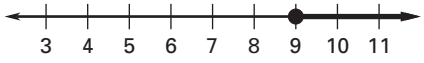
EXAMPLE 4 Solve an inequality using subtraction

Solve $13 \leq x + 4$. Graph your solution.

Solution

$13 \leq x + 4$	Write original inequality.
$13 - 4 \leq x + 4 - 4$	Subtract 4 from each side.
$9 \leq x$	Simplify.

You can rewrite $9 \leq x$ as $x \geq 9$. The solutions are all real numbers greater than or equal to 9.



Exercises for Examples 3 and 4

Solve the inequality. Graph your solution.

5. $x - 7 \leq -3$

6. $5.1 > y - 2.7$

7. $z + 9 < -1$

8. $6 \leq w + 1.5$