Chapter 4 **Fair Game Review**

Graph the inequality.
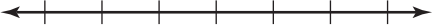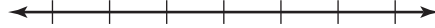
1. $x < -3$

2. $x \geq -5$

3. $x \leq 2$

4. $x > 7$

5. $x \leq -2.3$

6. $x > \dfrac{2}{5}$

7. The deepest free dive by a human in the ocean is 417 feet. The depth humans have been in the ocean can be represented by the inequality $x \leq 417$. Graph the inequality.

Name _____ Date _____

Complete the number sentence with < or >.

8. $\dfrac{3}{4}$ _____ 0.2

9. $\dfrac{7}{8}$ _____ 0.7

10. -0.6 _____ $-\dfrac{2}{3}$

11. -1.76 _____ 1.75

12. $\dfrac{17}{3}$ _____ 6

13. 1.8 _____ $\dfrac{31}{16}$

14. Your height is 5 feet and $1\dfrac{5}{8}$ inches. Your friend's height is 5.6 feet. Who is taller? Explain.

4.1 Writing and Graphing Inequalities

For use with Activity 4.1

Essential Question How can you use a number line to represent solutions of an inequality?

1 **ACTIVITY:** Understanding Inequality Statements

Work with a partner. Read the statement. Circle each number that makes the statement true, and then answer the questions.

a. "You are in **at least** 5 of the photos."

–3   –2   –1   0   1   2   3   4   5   6

- What do you notice about the numbers that you circled?

- Is the number 5 included? Why or why not?

- Write four other numbers that make the statement true.

b. "The temperature is **less than** –4 degrees Fahrenheit."

–7   –6   –5   –4   –3   –2   –1   0   1   2

- What do you notice about the numbers that you circled?

- Can the temperature be exactly –4 degrees Fahrenheit? Explain.

- Write four other numbers that make the statement true.

c. "**More than** 3 students from our school are in the chess tournament."

–3   –2   –1   0   1   2   3   4   5   6

- What do you notice about the numbers that you circled?

4.1 Writing and Graphing Inequalities (continued)

- Is the number 3 included? Why or why not?

- Write four other numbers that make the statement true.

d. "The balance in a yearbook fund is **no more than** −$5."

$$-7 \quad -6 \quad -5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2$$

- What do you notice about the numbers that you circled?

- Is the number −5 included? Why or why not?

- Write four other numbers that make the statement true.

---

2 ACTIVITY: Understanding Inequality Symbols

Work with a partner.

a. Consider the statement "x is a number such that $x > -1.5$."

- Can the number be exactly −1.5? Explain.

- Make a number line. Shade the part of the number line that shows the numbers that make the statement true.

- Write four other numbers that are not integers that make the statement true.

b. Consider the statement "x is a number such that $x \le \dfrac{5}{2}$."

- Can the number be exactly $\dfrac{5}{2}$? Explain.

Name_____ Date_____

- Make a number line. Shade the part of the number line that shows the numbers that make the statement true.

- Write four other numbers that are not integers that make the statement true.

3 **ACTIVITY:** Writing and Graphing Inequalities

Work with a partner. Write an inequality for each graph. Then, in words, describe all the values of x that make the inequality true.

a.

b.

c.

d.
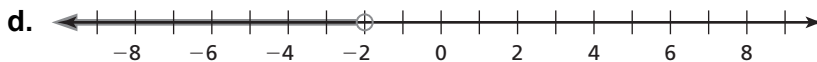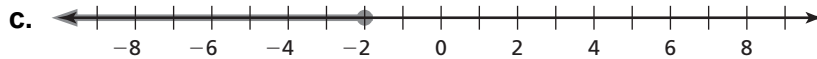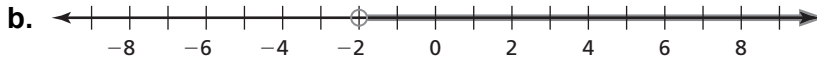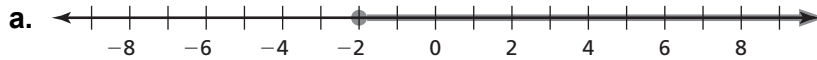
What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you use a number line to represent solutions of an inequality?

5. **STRUCTURE** Is $x \geq -1.4$ the same as $-1.4 \leq x$? Explain.

Name _____ Date _____

4.1 Practice

For use after Lesson 4.1

Write the word sentence as an inequality.

1. A number t is less than or equal to 5.

2. A number g subtracted from 6 is no more than $\dfrac{3}{4}$.

Tell whether the given value is a solution of the inequality.

3. $r - 3 \leq 9; r = 8$

4. $4h > -12; h = -5$

Graph the inequality on a number line.

5. $y > -1$

6. $d \leq 2.5$

7. $s \geq 3\dfrac{3}{4}$

8. $p < 9$

9. You have at most 30 games on your smart phone. Write an inequality that represents this situation.

Name_____ Date_____

4.2 Solving Inequalities Using Addition or Subtraction
For use with Activity 4.2

Essential Question How can you use addition or subtraction to solve an inequality?

1 ACTIVITY: Writing an Inequality

Work with a partner. Members of the Boy Scouts must be less than 18 years old. In 4 years, your friend will still be eligible to be a scout.

  a. Which of the following represents your friend's situation? What does x represent? Explain your reasoning.

| $x + 4 > 18$ | $x + 4 < 18$ | $x + 4 \geq 18$ | $x + 4 \leq 18$ |

  b. Graph the possible ages of your friend on a number line. Explain how you decided what to graph.

2 ACTIVITY: Writing an Inequality

Work with a partner. Supercooling is the process of lowering the temperature of a liquid or a gas below its freezing point without it becoming a solid. Water can be supercooled to 86°F below its normal freezing point (32°F) and still not freeze.

  a. Let x represent the temperature of water. Which inequality represents the temperature at which water can be a liquid or a gas? Explain your reasoning.

| $x - 32 > -86$ | $x - 32 < -86$ | $x - 32 \geq -86$ | $x - 32 \leq -86$ |

4.2   **Solving Inequalities Using Addition or Subtraction (continued)**

b. On a number line, graph the possible temperatures at which water can be a liquid or a gas. Explain how you decided what to graph.

←———|———|———|———|———|———|———|———|———|———|———|———|———→
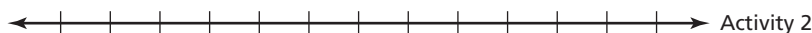
3   **ACTIVITY:** Solving Inequalities

Work with a partner. Complete the following steps for Activity 1. Then repeat the steps for Activity 2.

- Use your inequality from part (a). Replace the inequality symbol with an equal sign.

- Solve the equation.

- Replace the equal sign with the original inequality symbol.

- Graph this new inequality.

←———|———|———|———|———|———|———|———|———|———|———|———|———→ Activity 1

←———|———|———|———|———|———|———|———|———|———|———|———|———→ Activity 2

- Compare the graph with your graph in part (b). What do you notice?

4.2 **Solving Inequalities Using Addition or Subtraction (continued)**

4 **ACTIVITY:** Temperatures of Continents

Work with a partner. The table shows the lowest recorded temperature on each continent. Write an inequality that represents each statement. Then solve and graph the inequality.

Continent	Lowest Temperature
Africa	−11°F
Antarctica	−129°F
Asia	−90°F
Australia	−9.4°F
Europe	−67°F
North America	−81.4°F
South America	−27°F

a. The temperature at a weather station in Asia is more than 150°F greater than the record low in Asia.
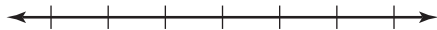
b. The temperature at a research station in Antarctica is at least 80°F greater than the record low in Antarctica.

What Is Your Answer?

5. IN YOUR OWN WORDS How can you use addition or subtraction to solve an inequality?

6. Describe a real-life situation that you can represent with an inequality. Write the inequality. Graph the solution on a number line.

Name _____ Date _____

4.2 **Practice**

For use after Lesson 4.2

Solve the inequality. Graph the solution.

1. $y - 3 \geq -12$

2. $-14 \leq 8 + x$

3. $t - 4 < -4$

4. $-9 \geq 2 + d$

5. $-3.4 > c - 1.2$

6. $j + \dfrac{5}{12} < -\dfrac{3}{4}$

7. A bounce house can hold 15 children. Seven children go in the bounce house. Write and solve an inequality that represents the additional number of children that can go in the bounce house.

Name_____ Date_____

4.3 Solving Inequalities Using Multiplication or Division
For use with Activity 4.3

Essential Question How can you use multiplication or division to solve an inequality?
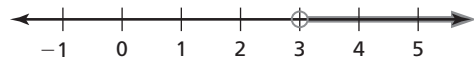
1 ACTIVITY: Using a Table to Solve an Inequality

Work with a partner.

- **Complete the table.**
- **Decide which graph represents the solution of the inequality.**
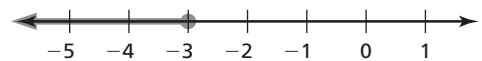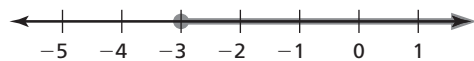- **Write the solution of the inequality.**

a. $4x > 12$

x	−1	0	1	2	3	4	5
4x							
$4x \overset{?}{>} 12$							

b. $-3x \le 9$

x	−5	−4	−3	−2	−1	0	1
−3x							
$-3x \overset{?}{\le} 9$							

4.3 **Solving Inequalities Using Multiplication or Division (continued)**

2 **ACTIVITY: Solving an Inequality**

Work with a partner.

a. Solve $-3x \leq 9$ by adding $3x$ to each side of the inequality first. Then solve the resulting inequality.

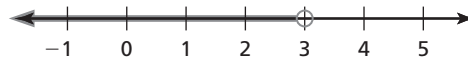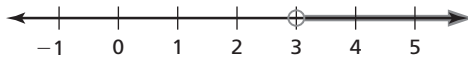**b.** Compare the solution in part (a) with the solution in Activity 1(b).

3 **ACTIVITY: Using a Table to Solve an Inequality**

Work with a partner.

- **Complete the table.**
- **Decide which graph represents the solution of the inequality.**
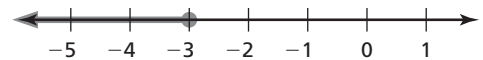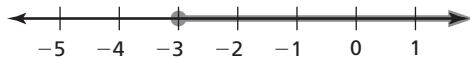- **Write the solution of the inequality.**

a. $\dfrac{x}{3} < 1$

x	-1	0	1	2	3	4	5
$\dfrac{x}{3}$							
$\dfrac{x}{3} \overset{?}{<} 1$							

4.3 **Solving Inequalities Using Multiplication or Division** (continued)

b. $\dfrac{x}{-4} \geq \dfrac{3}{4}$

x	−5	−4	−3	−2	−1	0	1
$\dfrac{x}{-4}$							
$\dfrac{x}{-4} \overset{?}{\geq} \dfrac{3}{4}$							

4 **ACTIVITY:** Writing Rules

Work with a partner. Use a table to solve each inequality.

a. $-2x \leq 10$ **b.** $-6x > 0$ **c.** $\dfrac{x}{-4} < 1$ **d.** $\dfrac{x}{-8} \geq \dfrac{1}{8}$

x												
−2x												
−6x												
$\dfrac{x}{-4}$												
$\dfrac{x}{-8}$												

Write a set of rules that describes how to solve inequalities like those in Activities 1 and 3. Then use your set of rules to solve each of the four inequalities above.

What Is Your Answer?

5. **IN YOUR OWN WORDS** How can you use multiplication or division to solve an inequality?

Name _____ Date _____

Solve the inequality. Graph the solution.

1. $6n < 90$

2. $\dfrac{x}{4} \le -18$

3. $-20t > -80$

4. $-3q \ge 91.5$
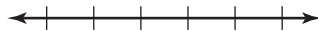
5. $-4p < \dfrac{2}{3}$

6. $-8 \ge 1.6m$

7. $-\dfrac{r}{4} \le -10$

8. $-\dfrac{t}{5} > 2.5$

9. $-2 \ge \dfrac{q}{-0.3}$

10. To win a game, you need at least 45 points. Each question is worth
3 points. Write and solve an inequality that represents the number of
questions you need to answer correctly to win the game.

Name_____ Date_____

4.4 Solving Two-Step Inequalities
For use with Activity 4.4

Essential Question How can you use an inequality to describe the dimensions of a figure?

---

1 **ACTIVITY:** Areas and Perimeters of Figures

Work with a partner.

- **Use the given condition to choose the inequality that you can use to find the possible values of the variable. Justify your answer.**

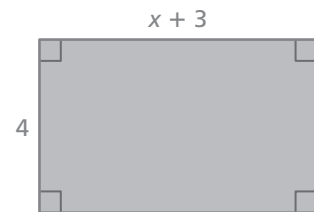- **Write four values of the variable that satisfy the inequality you chose.**

a. You want to find the values of x so that the area of the rectangle is more than 22 square units.

$x + 3$

| $4x + 12 > 22$ | $4x + 3 > 22$ |

| $4x + 12 \geq 22$ | $2x + 14 > 22$ |

4

b. You want to find the values of x so that the perimeter of the rectangle is greater than or equal to 28 units.

| $x + 7 \geq 28$ | $4x + 12 \geq 28$ | $2x + 14 \geq 28$ | $2x + 14 \leq 28$ |

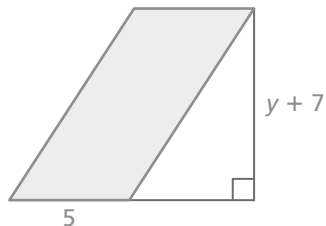**4.4** **Solving Two-Step Inequalities** (continued)

c. You want to find the values of y so that the area of
the parallelogram is fewer than 41 square units.

| $5y + 7 < 41$ | $5y + 35 < 41$ |

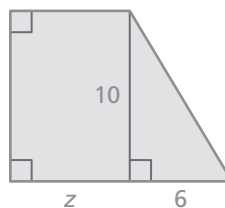| $5y + 7 \leq 41$ | $5y + 35 \leq 41$ |

$y + 7$

5

d. You want to find the values of z so that the area of
the trapezoid is at most 100 square units.

| $5z + 30 \leq 100$ | $10z + 30 \leq 100$ |

| $5z + 30 < 100$ | $10z + 30 < 100$ |

10

z 6

---

2 **ACTIVITY:** Volumes of Rectangular Prisms
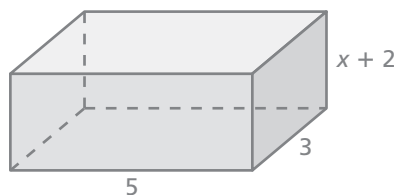
Work with a partner.

- **Use the given condition to choose the inequality that you can use to
  find the possible values of the variable. Justify your answer.**

- **Write four values of the variable that satisfy the inequality you chose.**

a. You want to find the values of x so that the volume
of the rectangular prism is at least 50 cubic units.

| $15x + 30 > 50$ | $x + 10 \geq 50$ |

| $15x + 30 \geq 50$ | $15x + 2 \geq 50$ |

$x + 2$

3

5
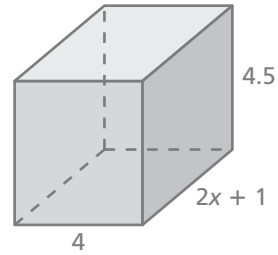
4.4   **Solving Two-Step Inequalities (continued)**

b. You want to find the values of x so that the volume of the rectangular prism is no more than 36 cubic units.

$8x + 4 < 36$

$2x + 9.5 \leq 36$

$36x + 18 < 36$

$36x + 18 \leq 36$

4.5

2x + 1

4

What Is Your Answer?

3. **IN YOUR OWN WORDS** How can you use an inequality to describe the dimensions of a figure?

4. Use what you know about solving equations and inequalities to describe how you can solve a two-step inequality. Give an example to support your explanation.

Name _____ Date _____

4.4 **Practice**
For use after Lesson 4.4

Solve the inequality. Graph the solution.

1. $5 - 3x > 8$

2. $-4x - 7 \leq 9$

3. $3 + 4.5x \geq 21$

4. $-2y - 5 > \dfrac{5}{2}$

5. $2(y - 4) < -18$

6. $-6 \geq -6(y - 3)$

7. You borrow $200 from a friend to help pay for a new laptop computer. You pay your friend back $12 per week. Write and solve an inequality to find when you will owe your friend less than $60.