

## Section 1.7 Linear Inequalities

**Objective:** In this lesson you learned how to solve linear inequalities and inequalities involving absolute value.

Course Number

Instructor

Date

**Important Vocabulary** Define each term or concept.

**Solution of an inequality**

**Graph of an inequality**

**Linear inequality in one variable**

**Double inequality**

### I. Introduction to Inequalities (Page 143)

Solving an inequality in the variable  $x$  means . . .

***What you should learn***  
How to use the language of inequalities

Such values are solutions and are said to \_\_\_\_\_ the inequality.

- Example 1:** (a) Write the inequality as an interval and state whether it is bounded or unbounded:  $x \leq -16$ .  
(b) Decide whether the interval  $[4, 12)$  is bounded or unbounded and then write it as an inequality.

### II. Properties of Inequalities (Page 144)

To solve a linear inequality in one variable, use the \_\_\_\_\_ to isolate the variable.

***What you should learn***  
How to recognize solutions of linear inequalities

When each side of an inequality is multiplied or divided by a negative number, . . .

Two inequalities that have the same solution set are

\_\_\_\_\_.

Complete the list of Properties of Inequalities given below.

- 1) Transitive Property:  $a < b$  and  $b < c \rightarrow$  \_\_\_\_\_
- 2) Addition of Inequalities:  $a < b$  and  $c < d \rightarrow$  \_\_\_\_\_
- 3) Addition of a Constant  $c$ :  $a < b \rightarrow$  \_\_\_\_\_
- 4) Multiplication by a Constant  $c$ :
  - For  $c > 0$ ,  $a < b \rightarrow$  \_\_\_\_\_
  - For  $c < 0$ ,  $a < b \rightarrow$  \_\_\_\_\_

### III. Solving a Linear Inequality (Pages 145–146)

Describe the steps that would be necessary to solve the linear inequality  $7x - 2 < 9x + 8$ .

***What you should learn***  
How to use properties of inequalities to solve linear inequalities

The two inequalities  $-10 < 3x$  and  $14 \geq 3x$  can be rewritten as the double inequality \_\_\_\_\_.

### IV. Inequalities Involving Absolute Value (Page 147)

Let  $x$  be a variable or an algebraic expression and let  $a$  be a real number such that  $a \geq 0$ . The solutions of  $|x| < a$  are all values of  $x$  that \_\_\_\_\_. The solutions of  $|x| > a$  are all values of  $x$  that \_\_\_\_\_.

***What you should learn***  
How to solve inequalities involving absolute values

**Example 2:** Solve the inequality:  $|x + 11| - 4 \leq 0$

The symbol  $\cup$  is called a \_\_\_\_\_ symbol and is used to denote \_\_\_\_\_.

**Example 3:** Write the following solution set using interval notation:  $x > 8$  or  $x < 2$

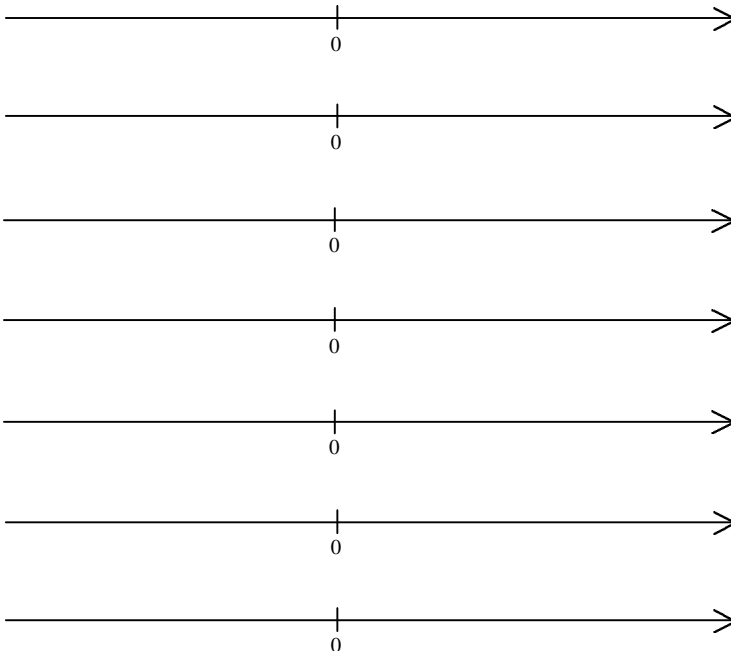
### V. Applications of Linear Inequalities (Page 148)

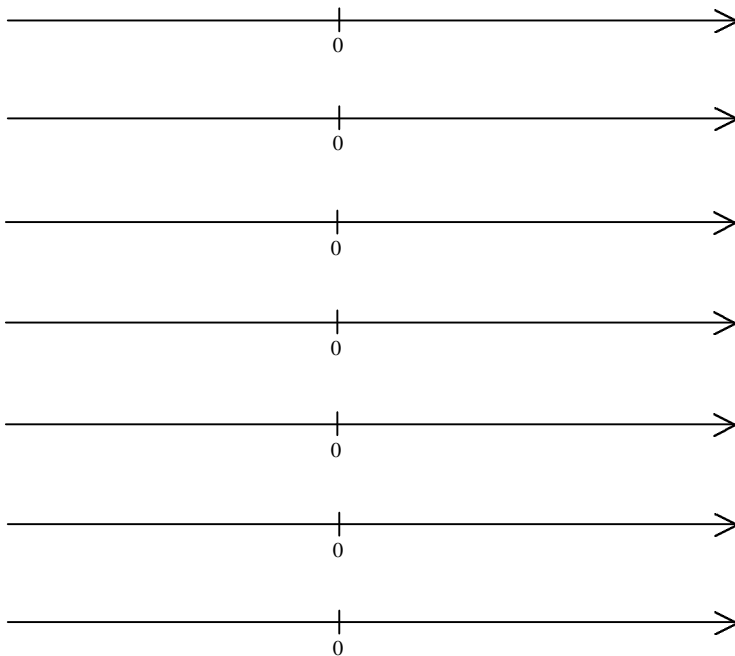
Describe a real-life situation that involves a linear inequality.

***What you should learn***  
How to use inequalities to model and solve real-life problems

Describe a real-life problem that could be solved using an absolute value inequality.

### Additional notes



**Additional notes****Homework Assignment**

Page(s)

Exercises