

GUIDED NOTES – 2.7 LINEAR INEQUALITIES AND ABSOLUTE VALUE INEQUALITIES

LEARNING OBJECTIVES

In this section, you will:

- Use interval notation.
- Use properties of inequalities.
- Solve inequalities in one variable algebraically.
- Solve absolute value inequalities.

USING INTERVAL NOTATION

- Indicating solutions to an inequality can be achieved in several ways, such as number line, set-builder notation, and interval notation. Interval notation is when solution sets are indicated with _____.
- Please fill out the table below.

Set Indicated	Set-Builder Notation	Interval Notation
All numbers between a and b , but not including a or b .		
All numbers greater than a , but not including a .		
All numbers less than b , but not including b .		
All numbers greater than a , including a .		
All numbers less than b , including b .		
All real numbers between a and b , including a .		
All real numbers between a and b , including b .		
All real numbers between a and b , including a and b .		
All real numbers less than a or greater than b .		
All real numbers.		

Try It: Read Example 1 in the text, then answer the following.

Use interval notation to indicate all real numbers between and including -3 and 5.

Try It: Read Example 2 in the text, then answer the following.

Express all real numbers less than -2 or greater than or equal to 3 in interval notation.

USING THE PROPERTIES OF INEQUALITIES

Study the box in your textbook section titled “properties of inequalities.”

- Given $a < b$, please fill out the following properties.

Addition Property: If $a < b$, then _____.

Multiplication Property: If $a < b$ and _____, then _____.

If $a < b$ and _____, then _____.

- Remember that these properties also apply to $a \leq b$, $a > b$, and $a \geq b$.

Try It: Read Example 3 in the text, then answer the following.

Solve: $3x - 2 < 1$.

Try It: Read Example 4 in the text, then answer the following.

Solve: $4x + 7 \geq 2x - 3$

SOLVING INEQUALITIES IN ONE VARIABLE ALGEBRAICALLY

Try It: Read Example 5 in the text, then answer the following.

Solve the inequality and write the answer using interval notation: $-x + 4 < \frac{1}{2}x + 1$.

Try It: Read Example 6 in the text, then answer the following.

Solve the inequality and write the answer in interval notation: $-\frac{5}{6}x \leq \frac{3}{4} + \frac{8}{3}x$.

UNDERSTANDING COMPOUND INEQUALITIES

- A _____ includes two inequalities in one statement. There are two ways to solve compound inequalities. List the two ways below.

1.

2.

Try It: Read Example 7 in the text, then answer the following.

Solve the compound inequality: $4 < 2x - 8 \leq 10$.

Try It: Read Example 8 in the text, then answer the following.

Solve the compound inequality: $3y < 4 - 5y < 5 + 3y$.

SOLVING ABSOLUTE VALUE INEQUALITIES

Study the box in your textbook section titled “absolute value inequalities.”

- Given an algebraic expression X , and $k > 0$, an absolute value inequality is an inequality of the form

$|X| < k$ is equivalent to _____

$|X| > k$ is equivalent to _____

*Remember these statements also apply to $|X| \leq k$ and $|X| \geq k$.

Try It: Read Example 9 in the text, then answer the following.

Describe all x -values within a distance of 3 from the number 2.

Try It: Read Example 10 in the text, then answer the following.

Solve $|x - 4| \leq 10$.