

Name \_\_\_\_\_ Period \_\_\_\_\_

## Linear Inequalities



Inequality signs: a \_\_\_\_\_ b a is \_\_\_\_\_ b  
a \_\_\_\_\_ b a is \_\_\_\_\_ b  
a \_\_\_\_\_ b a is \_\_\_\_\_ b  
a \_\_\_\_\_ b a is \_\_\_\_\_ b

Graphing: When  $x$  is \_\_\_\_\_ a constant, you \_\_\_\_\_ an  
\_\_\_\_\_ going to the \_\_\_\_\_ of the constant.

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An \_\_\_\_\_ is used to show  $>$  or  $<$  on a graph.

Example:

When  $x$  is  $x < c$    
or when  $x$  is  $x > c$  

a \_\_\_\_\_ is used to show  $\geq$  or  $\leq$  on a graph.

Example:

$x \leq c$    $x \geq c$  

Addition/Subtraction Property for Inequalities:

If a \_\_\_\_\_ b, then  $a + c$  \_\_\_\_\_  $b + c$

If a \_\_\_\_\_ b, then  $a - c$  \_\_\_\_\_  $b - c$

In other words, adding or subtracting the same expression to both sides of an inequality does not change the inequality.

Examples:

$$x - 7 < -3$$

$$x + 10 \geq 5$$

Multiplication/Division Properties for Inequalities:

If a \_\_\_\_\_ b AND c is POSITIVE, then  $ac$  \_\_\_\_\_  $bc$

If a \_\_\_\_\_ b AND c is POSITIVE, then  $a/c$  \_\_\_\_\_  $b/c$

Example:

Solve

Graph

$$5x < -10$$

$$\frac{x}{3} > 1$$

Multiplying or dividing both sides by the same positive value does not change the inequality.

If a \_\_\_\_\_ b AND c is NEGATIVE, then  $ac$  \_\_\_\_\_  $bc$

If a \_\_\_\_\_ b AND c is NEGATIVE, then  $a/c$  \_\_\_\_\_  $b/c$

Example:

Solve

Graph

$$\frac{-x}{2} > 7$$

$$-3x \geq 9$$

Strategy for Solving a Linear Inequality:

Step 1: \_\_\_\_\_

Step 2: \_\_\_\_\_

Step 3: \_\_\_\_\_

Practice:  $-3x - 3 < 6$

$4(x + 1) > 6$