***2.5 Inequalities***

* 🡪 *c* is less than *d* 🡪 *c* is to the left of *d* on the number line
* 🡪 *c* is less than *d* 🡪 *c* is to the right of *d* on the number line
* are equivalent, and both mean that is positive:

Ex:

* is a compound inequality which means and

Interval Notation with illustrations:

denotes the set of all real numbers *x* such that

denotes the set of all real numbers *x* such that ­­­\_\_\_\_\_\_\_\_\_\_\_

denotes the set of all real numbers *x* such that \_\_\_\_\_\_\_\_\_\_\_\_

denotes the set of all real numbers *x* such that \_\_\_\_\_\_\_\_\_\_\_

denotes the set of all real numbers *x* such that­­­­­­\_\_\_\_\_\_\_\_\_\_\_

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***Solving Inequalities using Algebraic or Graphical Methods:***

*Algebraic Method:* You can add or subtract any number from both sides of the inequality. Likewise you can multiply or divide any **positive** number.

\*Multiplying or dividing a **negative** number means you have to *reverse the direction of the inequality.*

**Example 1:** Solving a Compound Linear Inequality

**Example 2:** Solving a Compound Linear Inequality

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**Solving Other Non-Linear Inequalities**

* The solutions of an inequality of the form {} consist of intervals on the x-axis where the graph of *f* is below {above} the graph of *g*

Picture Example:

* The solutions of an inequality of the form

{} consist of intervals on the x-axis where the graph is above {below} the axis.

Picture Example:

**Example 3: Solving an Inequality**

***Solving Quadratic and Factorable Inequalities***

**Example 4: Solving a Quadratic Inequality**

**Example 5: Solving a Factorable Inequality**

**Summary:**

1. Write the inequality with zero on one side:
2. Find the zeros of the function
3. Find the interval, or intervals, on the x-axis where the graph of the function is above (or below) the x-axis