**Inequalities**

An inequality is a relation between two expressions that are not equal. The common inequalities that we work with are summarized below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Not equal to | Less than | Less than or equal to | Greater than | Greater than or equal to |

**Linear Inequalities**

Linear inequalities involve two linear expressions. We have already solved basic linear inequalities when we covered domain.

For example, the domain of would be all real numbers such that which results in .

Example 1: Solve the following linear inequalities.

**Compound Inequalities**

Compound inequalities express more than one inequality in a single statement.

For example, instead of stating and we could combine these two statements to form the compound inequality .

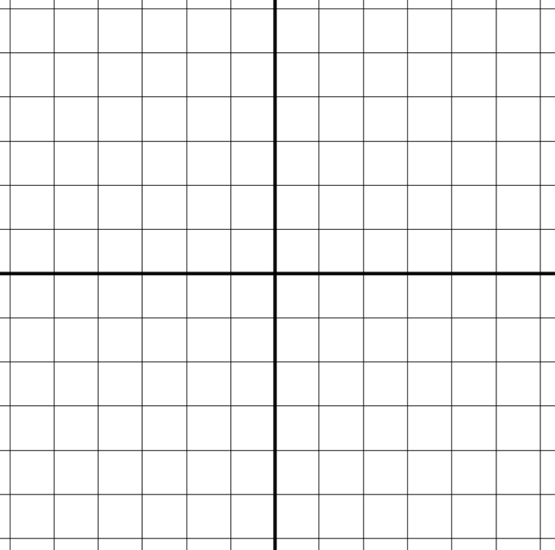
When working with compound inequalities, it is important to remember that you are manipulated more than one inequality at all times.

Example 2: Solve the following compound inequality.

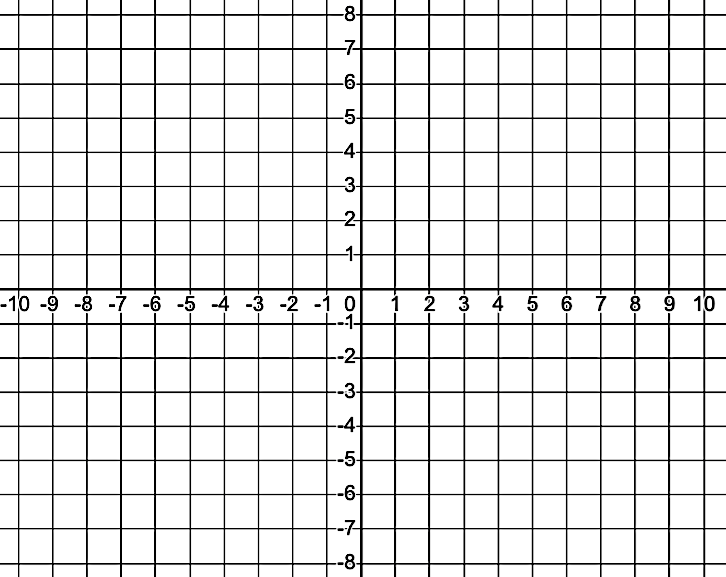
**Polynomial Inequalities**

Polynomial inequalities involve two polynomial expressions. It is often easiest to compare a single polynomial expression to zero, and then think graphically.

Example 3: Solve the polynomial inequality and provide your solution in interval notation.



Example 4: Determine the domain of the radical function.



**Rational Inequalities**

Rational inequalities involve two rational expressions. Once again, it is often easiest to compare a single rational expression to zero, and then think graphically.

Example 5: Solve the following rational inequality

