

## Section 1.7 Linear Inequalities in One Variable

Unlike equations which usually have a finite number of solutions (or no solution at all), inequalities often have infinitely many solutions. We typically describe the solutions to an inequality in one of three ways:

- 1) Graph the solution on a number line.
- 2) Write the solution in set builder notation.
- 3) Write the solution in interval notation.

### Objective 1: Solving Linear Inequalities

**Definition:** A **linear inequality** is an inequality that can be written in the form  $ax + b < c$  where  $a, b$  and  $c$  are real numbers and  $a \neq 0$ .

Note that the inequality symbol “ $<$ ” in the definition above can be replaced with either  $>$ ,  $\leq$ , or  $\geq$ .

The technique to use when solving linear inequalities is to isolate the variable on one side.



**Remember to reverse the direction of the inequality when multiplying or dividing a linear inequality by a negative number.**

## Objective 2: Solving Three-Part Inequalities

The technique to use when solving three-part inequalities is to simplify until the variable is “sandwiched” in the middle. It is good practice to rewrite the inequality so that the smaller of the two outside numbers is on the left. A number is a solution to a three-part inequality if it is a solution to **both** inequalities.