

2.7 Solving Linear Inequalities

A *linear inequality* in *one* variable is written in the form $ax + b \leq c$ where the \leq can be replaced with any inequality symbol – $<$, $>$, \leq , \geq . Solving a linear inequality gives a **solution set** as opposed to a single solution. The solution set can be expressed as an interval or inequality and can be graphed on a number line.

Inequality	Interval	Set-Builder	Graph
$x > a$			
$x \geq a$			
$x < a$			
$x \leq a$			

Example 2.7.1

Solve and graph the following inequality:

$$x + 6 < 9$$

Example 2.7.2

Solve and graph the following inequality:

$$8x - 2 \geq 7x - 4$$

Note: When working with inequalities, if you *multiply or divide* by a negative number, you must *flip the direction of the inequality*.

Example 2.7.3

Solve and graph the inequality:

$$-6x < 18$$

Example 2.7.4

Solve and graph:

$$5y - 3 \geq 17$$

Example 2.7.5

Solve and graph:

$$6 - 3x \leq 5x - 2$$

Example 2.7.6

Solve and graph:

$$2(x - 3) - 1 \leq 3(x + 2) - 14$$

Example 2.7.7

Solve and graph:

$$4(x + 2) > 4x + 15$$

Example 2.7.8

Solve and graph:

$$2(x + 5) \leq 5x - 3x + 14$$

Example 2.7.9

You must have an average score of 80% to earn a B. On your first three tests, you have scores of 82%, 74% and 78%. If the final counts as two grades, what must you get on the final to earn a B in the class?

Remember that the average of a set of values is found by adding all the values and dividing by the total number of values.