# Pre-Algebra
# Inequalities

## Inequality Signs

The following signs are used in inequalities;

- $<$ − Less than sign. $a < b$ is read "$a$ is less than $b$."
- $\leq$ − Less than or equal sign. $a \leq b$ is read "$a$ is less than or equal to $b$."
- $>$ − Greater than sign. $a > b$ is read "$a$ is greater than $b$."
- $\geq$ − Greater than or equal sign. $a \geq b$ is read "$a$ is greater than or equal to $b$."

## Relationship to Equations

Inequalities are solved in much the same way as equations. There are a couple of differences you should be aware of:

- When you multiply or divide by a negative number, you must flip the sign. That is,

  $" < "$ becomes $" > "$

  $" \leq "$ becomes $" \geq "$

  $" > "$ becomes $" < "$

  $" \geq "$ becomes $" \leq "$

- When you switch sides of an inequality you must flip the sign.

**Examples:**

| Example 1: | | Example 2: | |
|---|---|---|---|
| Solve: | $x + 4 \leq -1$ | Solve: | $-3x > 9$ |
| Subtract 4: | $-4 \quad -4$ | Divide by –3: | $\div(-3) \quad \div(-3)$ |
| Result: | $x \leq -5$ | Flip Sign: | $x < -3$ |

**A Trick** − Think about the two sides of the inequality signs. The pointy side is small, and the open side is large. Then,

- The smaller expression is on the pointy (smaller) side of the sign.
- The larger expression is on the open (larger) side of the sign.

| Example 3: | |
|---|---|
| Switch sides: | $6 < x$ |
| Flip Sign: | $x > 6$ |