

Lesson 7-6

Example 1 Solve a Two-Step Inequality

Solve $3x - 5 > -11$ and check your solution. Graph the solution on a number line.

$3x - 5 > -11$	Write the inequality.
$3x - 5 + 5 > -11 + 5$	Add 5 to each side.
$3x > -6$	Simplify.
$x > -2$	Mentally divide each side by 3.

To check your solution, try -1, a number greater than -2.

CHECK $3x - 5 > -11$	Write the inequality.
$3(-1) - 5 > -11$	Replace x with -1.
$-3 - 5 > -11$	Simplify.
$-8 > -11$ ✓	The solution checks.

Graph the solution, $x > -2$.



Example 2 Reverse the Inequality Symbol

Solve $-4 + 2m \leq 6 - 3m$ and check your solution. Graph the solution on a number line.

$-4 + 2m \leq 6 - 3m$	Write the inequality.
$-4 + 2m - 2m \leq 6 - 3m - 2m$	Subtract $2m$ from each side.
$-4 \leq 6 - 5m$	Simplify.
$-4 - 6 \leq 6 - 5m - 6$	Subtract 6 from each side.
$-10 \leq -5m$	Simplify.
$\frac{-10}{-5} \geq \frac{-5m}{-5}$	Divide each side by -5 and reverse the symbol.
$2 \geq m$	Simplify.

CHECK $-4 + 2m \leq 6 - 3m$	Try 1, a number less than or equal to 2.
$-4 + 2(1) \leq 6 - 3(1)$	Replace m with 1.
$-4 + 2 \leq 6 - 3$	Simplify.
$-2 \leq 3$ ✓	The solution checks.

Graph the solution, $m \leq 2$.



Example 3 Inequalities with Grouping Symbols**a. Solve $7(b - 3) > -7$.**

$7(b - 3) > -7$	Write the inequality.
$7b - 21 > -7$	Use the Distributive Property.
$7b - 21 + 21 > -7 + 21$	Add 21 to each side.
$7b > 14$	Simplify.
$\frac{7b}{7} > \frac{14}{7}$	Divide each side by 7.
$b > 2$	Simplify.

The solution is $b > 2$.**b. Solve $8(y + 4) \leq -8$.**

$8(y + 4) \leq -8$	Write the inequality.
$8y + 32 \leq -8$	Use the Distributive Property.
$8y + 32 - 32 \leq -8 - 32$	Subtract 32 from each side.
$8y \leq -40$	Simplify.
$\frac{8y}{8} \leq \frac{-40}{8}$	Divide each side by 8.
$y \leq -5$	Simplify.

The solution is $y \leq -5$.