

6.1 Solving Inequalities

Up until now we've been working on equalities or equations.

Each thing we've solved had an equal sign because two quantities were expressed as being equal in value.

Now we're going to express two quantities as being not equal.

Inequality Signs: $<$ (less than)
 $>$ (greater than)

★ Sometimes \leq is expressed as "at most" and \geq is expressed as "at least"

\leq (less than or equal to)
 \geq (greater than or equal to)
 \neq (not equal to)

Example: John can spend at most \$12.50 at the store. He buys a t-shirt and a pack of gum for \$11.25. Write an inequality which models how much he can spend on a soda and stay within his spending limit.

Let s = amount spent on soda.
The total amount he spends is $s + \$11.25$
The total amount has to be less than or equal to \$12.50 so...

$$s + \$11.25 \leq \$12.50$$

Graphing inequalities on a number line.

Important info here.

1. Solve inequality just like an equation

2. Open circle $<, >$
Closed circle \leq, \geq

Compound inequalities have more than one inequality sign

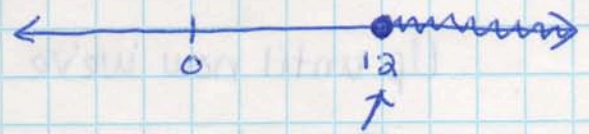
3. Shade or darken to left or right

$<$
 \leq

$>$
 \geq

Examples:

$$\begin{array}{r} m - 8 \geq 4 \\ +8 \quad +8 \\ \hline m \geq 12 \end{array}$$



Note the closed circle and shading to right.

6.2 Multistep Inequalities

Multistep inequalities are solved exactly like multistep equations, with just one exception!

★ If you multiply or divide by a negative number while solving an inequality, the inequality sign switches around.

Make sure you remember this caveat!! It is very important.

Here's what I mean

Example 1:

$$\begin{array}{r} -2m \geq 10 \\ \hline -2 \quad -2 \\ \hline m \leq -5 \end{array}$$

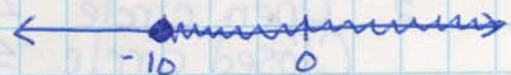
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Sign noticed !!!



Example 2:

$$\begin{array}{l} 3x - (2 + 6x) \leq 28 \\ \text{Distribute} \quad 3x - 2 - 6x \leq 28 \\ \text{Combine} \quad -3x - 2 \leq 28 \\ \quad \quad +2 \quad +2 \\ \quad \quad -3x \leq 30 \\ \quad \quad \hline \quad \quad -3 \quad -3 \\ \quad \quad x \geq -10 \end{array}$$

↑
Sign Switch



CW Pg 286 (31-45 odds)
or

CW Neg Multi Step.doc worksheet

H.W. Practice 7-3