e In

Day 09 Notes

Solving Inequalities, and Graphing on a Number Line

Name: Key

Date: _____

What is an INEQUALITY?

Two expressions that are Not equal.

Solution of an inequality: Any value that makes the inequality true.

example: $x > 5$ Any number you plug in that is greater than 5 is a true statement

Any number that makes the inequality *true*, when substituted for the variable, is a Solution of the inequality.

Symbol	What it means	Dot
$<$	less than, fewer than	○ open
$\leq$	less than or = to	● closed
$>$	greater than, more than	○ open
$\geq$	Greater than or = to	● closed
$\neq$	Not equal to	○ open

Key words
- At most
- No more than

Key words
- At least
- No less than

To SOLVE Inequalities:

- Solve using the same rules as solving equations. (Isolate the variable)
- EXCEPT:
  - When you multiply or divide by a NEGATIVE number, Flip! the inequality symbol.

Ex 1) $3x - 1 > 5$

$+1 \quad +1$

$\frac{3x}{3} > \frac{6}{3}$

$x > 2$

Ex 2) $-2x < 4$

$\frac{}{-2} \quad \frac{}{-2}$

flip!

$x > -2$

Ex 3) $2(x+1) \leq -3(x+4)$

$2x + 2 \leq -3x - 12$

$-2x \quad -2x$

$2 \leq -5x - 12$

$-12 \quad -12$

$\frac{-10}{-5} \leq \frac{-5x}{-5}$ flip

$2 \geq x$

To Graph on a Number Line:

- **Open Circle:** The number is NOT included as a solution
- **Closed Circle:** The number IS included as a solution

- **Shade the number line:**
  - Write the inequality with "x" FIRST
    - *Example:* if **2 < x**, then rewrite the inequality as **x > 2**
    - Careful!! When you change the order, FLIP THE SIGN.

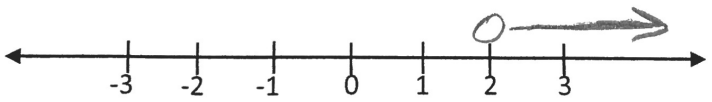
Symmetric Property ⇓ Flip Symbol

  - When **x <** OR **x ≤** ("less than") Shade left of the number (less than the number)
  - When **x >** OR **x ≥** ("greater than") Shade right of the number (greater than the number)

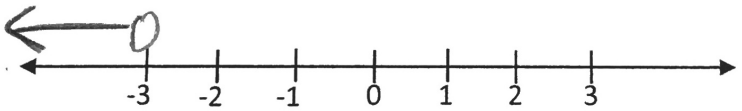
* only works when x comes first.

make an arrow →

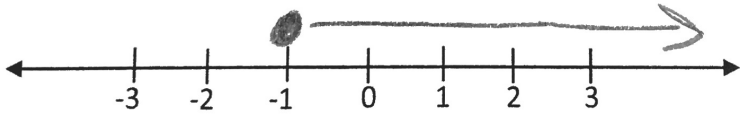
Ex 1) Graph the inequality on the number line: **x > 2** ("x is greater than 2")



Ex 2) Graph the inequality on the number line: **-3 > x** $x < -3$



Ex 3) Graph the inequality on the number line: **x ≥ -1**



Ex 4) Graph the inequality on the number line: **-4 ≥ x** $x \leq -4$