

# Equations and Inequalities

## Part 5: Writing & Graphing Inequalities

Essential Question:

How does the solution to an equation relate to the solutions of an inequality of the same nature?

How can I represent the solution to an equation or inequality on a number line (graph)?

# Think. Pair. Share.

- \* What is the solution to  $x = 5$ ?
- \* What are some solutions to  $x > 5$ ?
- \* Do you think it is possible to list every single solution to an inequality? Why or why not?

# Think. Pair. Share.

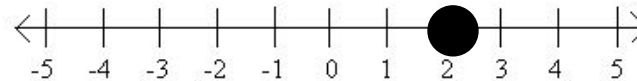
Is  $x \geq 5$  any different from  $x > 5$ ?

Why or why not?

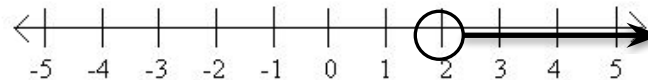
# Graphing

You can represent the solution to an equation or an inequality by graphing it on a number line.

$$X = 2$$



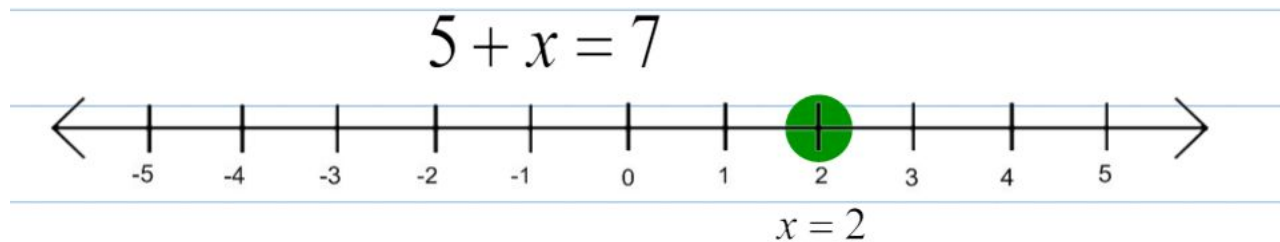
$$X > 2$$



# Graphing Equation Solutions

Equation Solutions – a point (a solid dot)


A solid circle states that the solution is the dot's value



# Graphing Inequality Solutions

Inequality Solutions – a point (solid or open) & an arrow

 **Solid dot:** - solution includes that exact value  
- used with  $\leq$  and  $\geq$

 **Open dot:** - solution **does not** include that exact value  
- used with  $<$  and  $>$

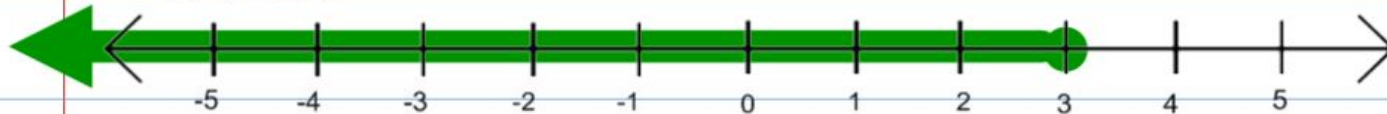
 **Left arrow:** - solution includes all values less  
- used with  $<$  and  $\leq$  *Only when 'x' is on the left!*

 **Right arrow:** - solution includes all values greater  
- used with  $>$  and  $\geq$  *Only when 'x' is on the left!*

# Examples of Inequality Solutions

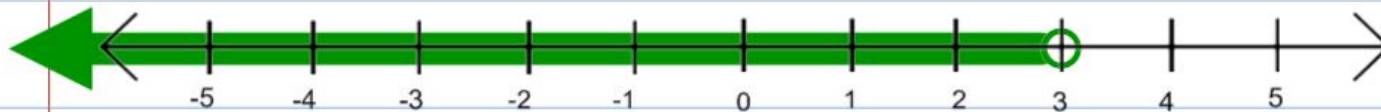
## Examples:

$$x \leq 3$$



Solution includes  $x=3$  and every value less than 3.

$$x < 3$$



Solution does not include  $x=3$  but includes everything less than 3 (like 2.9999)

# Practice

1. Graph  $x < 0$
2. Graph  $x \leq 1$
3. Graph  $x = 8$
4. Graph  $x > 7$



# Use the following words to fill in your chart.

Is more than

maximum

minimum

At most

not more than

is less than

Below

is not less than

above

Not smaller than

at least

is larger than

Is greater than

is not greater than

is smaller than

# Write and Graph an Inequality to represent the situation

1. Tommy ( $t$ ) has at least \$52
2. No more than 300 students ( $s$ ) can fit in the cafeteria
3. Sue has more than 5 pencils ( $p$ )
4. Abby has less than \$12

# Practice & Other Resources

- \* Holt Course 1
  - \* Chapter 2 Resource Book or Online Textbook (pages 76-77)
- \* <http://www.coolmath-games.com/o-greaterthansudoku/index.html>
- \* <http://teachers.henrico.k12.va.us/math/hcpsalgebra1/module4-1.html>