Inspiring Greatness

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

Algebra 1 S1

Graphing inequalities

April 14, 2020

Algebra I S1
Lesson: April 14, 2020

Objective/Learning Target:

Students can solve inequalities and graph inequalities on a number line

BELL RINGER

Graph: $2x + 4y = 8$.

Keep equation in standard form.

BELL RINGER SOLUTION

$2x + 4y = 8$

x-intercept:
Let $y = 0$

$2x + 4y = 8$

$2x + 4(0) = 8$

$2x + 0 = 8$

$\frac{2x}{2} = \frac{8}{2}$

$x = 4$

y- intercept:
Let $x = 0$

$2x + 4y = 8$

$2(0) + 4y = 8$

$0 + 4y = 8$

$\frac{4y}{4} = \frac{8}{4}$

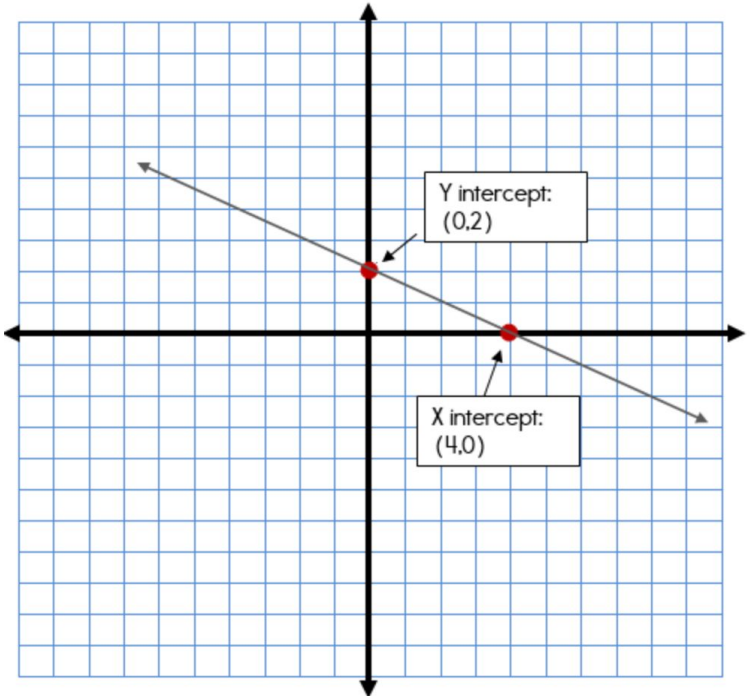
$y = 2$

BELL RINGER SOLUTION CONTINUED

Graph of 2x + 4y = 8

The x intercept is:
(4,0)

The y intercept is:
(0, 2)



Rules for solving inequalities

1. Make the same changes to both sides of the inequality
2. Isolate the variable
3. Combine Like Terms
4. Use the Inverse Operation to remove clutter away from variable
5. BUT, if your Inverse Operation is multiplication or division by a *negative number*, the inequality sign reverses

$<$ becomes $>$
$>$ becomes $<$
$\leq$ becomes $\geq$
$\geq$ becomes $\leq$

Inequality signs

>	Greater Than
≥	Greater Than or Equal To (The line underneath the greater than sign indicates also equal to)
<	Less Than (Tip: To remember this sign, if you open the sign up a little more, would look like a capital L for less than)
≤	Less Than or Equal To (The line underneath the less than sign indicates also equal to)

Solving inequalities- Example 1

$2y - 5 < 7$ Solve as you would with an equation:

$2y - 5 + 5 < 7 + 5$	Add 5 to BOTH sides.
$2y < 12$	Simplify.
$\frac{2y}{2} < \frac{12}{2}$	Divide by 2 on BOTH sides.
$y < 6$	Simplify.
Check: $2y - 5 < 7$ $2(4) - 5 < 7$ $8 - 5 < 7$ $3 < 7$ ☺	We must choose a number that is less than 6 to substitute. I chose 4, you may choose 5,3,2,-1 … any number less than 6! If your end statement is true, then your answer is correct.

Reversing the inequality symbol - Example 2

$6 \geq 2(x-4)$ Solve as you would with an equation.

$6 \geq 2x - 8$	Distribute.
$6 \ +8 \geq 2x - 8 \ +8$	Add 8 to BOTH sides.
$14 \geq 2x$	Simplify.
$\frac{14}{2} \geq \frac{2x}{2}$	Divide BOTH sides by 2
$7 \geq x$ $x \leq 7$	Final answer. This answer is easier read when the variable comes first and the answer last. So….. We'll flip the answer, but if we do we MUST reverse the sign too!
Check: $6 \geq 2(x-4)$ $6 \geq 2(7-4)$ $6 \geq 2(3)$ $6 \geq 6$ ☺	I can choose 7 to substitute or any number less than 7. I am going to choose 7. This is a true statement: 6 is greater than **OR Equal to** 6.

Rules for graphing inequalities

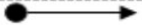
- When you graph inequalities that have only one variable, we use a number line. We will use open and closed circles and arrows pointing to the left or right to graph our answers.

- An open circle on the graph indicates less than (<) or greater than (>).

- A closed circle on the graph represents less than or equal to (≤) or greater than or equal to (≥).

Graphing inequalities

Graphing Symbols

	Greater Than (The open circle indicates that this is NOT Equal to the numeral graphed.
	Greater Than or Equal To (The closed circle indicates that this is Equal to the numeral graphed.
	Less Than (The open circle indicates that this is NOT Equal to the numeral graphed.
	Less Than or Equal To (The closed circle indicates that this is Equal to the numeral graphed.

Click to watch the video about solving and graphing inequalities.

Graphing inequalities-example 1

$x > 5$

x is greater than 5. I use an **open circle** on 5, since x is **NOT equal to** 5. Then I draw an arrow to the right to indicate that x can be any number greater than 5.

$x < -3$

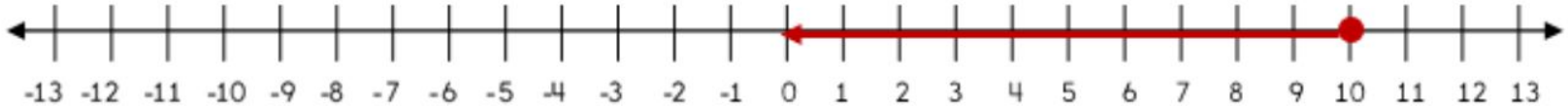
x is less than -3. I use an **open circle** on -3 since x is **NOT equal to** -3. Then I draw an

Graphing inequalities-example 2

$x \geq -2$

x is greater than OR equal to -2. I use a **closed circle** on -2 since x is also **equal to** -2. Then draw an arrow to the right to indicate that x can be any number greater than -2.

$x \leq 10$



x is less than OR equal to 10. I use a **closed circle** on 10 since x is also **equal to** 10.

Solving and graphing inequalities - part 1 of 2

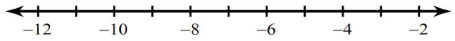
Infinite Algebra 1 Name_____

One-Step Inequalities

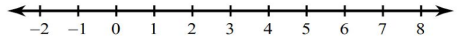
Date_____ Period____

Solve each inequality and graph its solution.

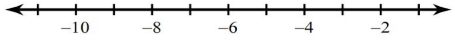
1) $-12 > x - 7$



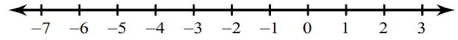
2) $-1 + r \geq 4$



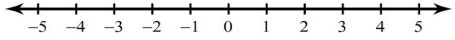
3) $n - 6 \leq -14$



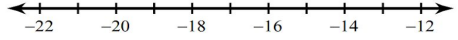
4) $b - 7 < -12$



5) $a - 17 > -16$

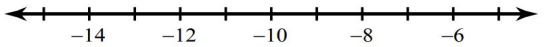


6) $15 + x \leq 0$

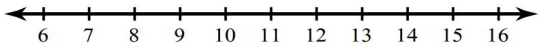


Solving and graphing inequalities - part 2 of 2

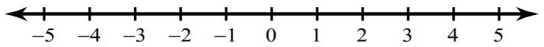
7) $3 + v \leq -9$



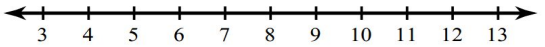
8) $8 \geq n - 6$



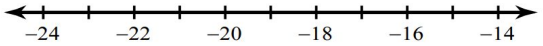
9) $-3x > 3$



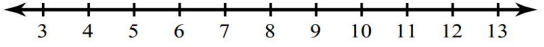
10) $\frac{n}{3} > 3$



11) $\frac{k}{4} < -4$



12) $-9x \geq -90$



WORKED OUT SOLUTIONS TO NUMBERS 1-12

https://www.youtube.com/watch?v=m5XCx8ElS34&t=14s