Algebra 2 Name: _____

Section 1-5: Solving Inequalities Date: _____

Big Ideas:

- Properties of inequality and properties of real numbers can be used to solve inequality statements.
- Some inequality statements are always true, some are sometimes true, and some are never true.

Vocabulary & Notation:

Vocabulary	**Definition**
Inequality statement	An algebraic statement of a relationship that is not equal.
Compound inequality	An inequality statement that joins two or more inequality statements.
Solve an inequality	Find all the values for the variable that make the inequality statement true.

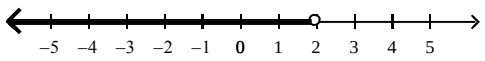
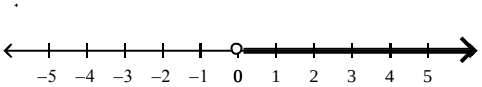
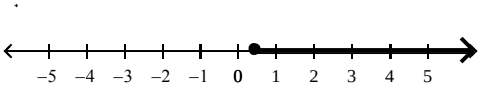
Algebraic Symbol	**Meaning**	**Example**
$<$	is less than	$0 < \frac{5}{4}$ "zero is less than five fourths"
$\leq$	is less than or equal to	$2 \leq 2$ "two is less than or equal to two"
$>$	is greater than	$0 > -\frac{2}{3}$ "zero is greater than negative two thirds"
$\geq$	is greater than or equal to	$1 \geq -2$ "one is greater than or equal to negative two"
$\neq$	Is not equal to	$7 \neq -7$ "seven is not equal to negative seven"

Skills. Try it. Write an algebraic inequality for each of the following:

1. A number is greater than two.
2. Four is less than k.
3. You must be at least 50 inches tall to ride the Super Flight at Rye Playland. Write an inequality that describes the heights of people who can ride.

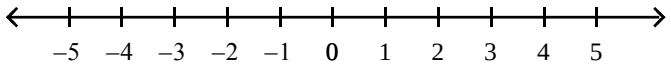
Section 1-5: Solving Inequalities Notes

Notation:

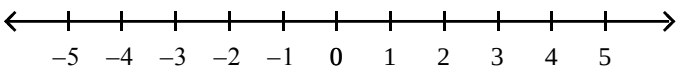
Algebraic Symbol	Graphing Symbol	Example
$<$	○ open circle	$x < 2$ 
$\leq$	● closed circle	$x \leq -1$ 
$>$	○ open circle	$x > 0$ 
$\geq$	● closed circle	$x \geq .5$ 

Skills. Try it. Graph each of the following inequalities:

1. $x \leq -\frac{3}{2}$



2. $3 > x$ (be careful!)



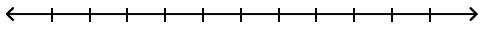
Section 1-5: Solving Inequalities Notes

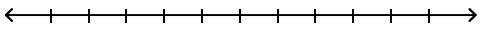
Rules: Properties of Inequalities.

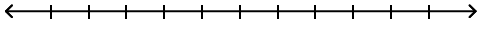
Let a, b and c be any real numbers.

Property	If…	Then….
Addition	$a > b$	$a + c > b + c$
Subtraction	$a > b$	$a - c > b - c$
Multiplication by a POSITIVE number	$a > b$	$a \cdot c > b \cdot c$ for $c > 0$
Division by a POSITIVE number	$a > b$	$\frac{a}{c} > \frac{b}{c}$ for $c > 0$
Multiplication by a NEGATIVE number REVERSES the inequality	$a > b$	$-a < -b$
Division by a NEGATIVE number REVERSES the inequality	$a > b$	$\frac{a}{-1} < \frac{b}{-1}$

Skills. Try it. Use properties of inequality to solve and graph the inequalities.

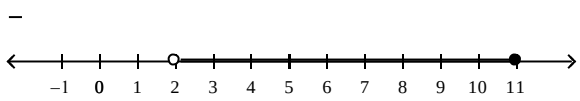
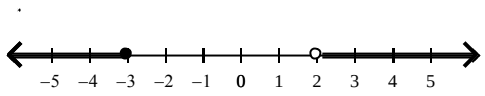
1. $3x - 5 > 2$ 

2. $7 - 3x \geq 2x + 1$ 

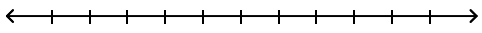
3. $-6x < -12$ 

Section 1-5: Solving Inequalities Notes

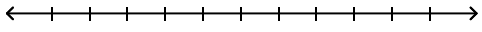
Vocabulary & Notation:

Compound Inequality Type	Notation	Graph
"AND" inequality BOTH inequalities must be true for AND to be true	$x > 2$ and $x \leq 11$ We can also write: $2 < x \leq 11$	
"OR" inequality EITHER inequality can be true for the OR statement to be true	$x \leq -3$ or $x > 2$	

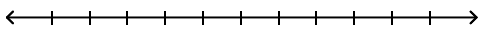
Skills. Try it. Graph the compound inequalities.

1. $-3 < x < 5$ 

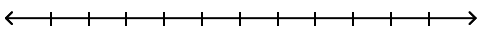
2. $-3 < x < 5$

3. $x \geq 2$ or $x \leq -1$ 

4. $x < 3$ or $x > 0$ (Why is this different than the other "or" statement?



Skills. Try it. Use properties of inequality to solve and graph the compound inequalities.

1. $2x + 1 > -2$ or $3x \leq x - 10$ 

2. $-3 \leq 11 - x < 0$