What is an Inequality?

It is an equation that instead of an "=", it has one of the following:

$<$, $>$, $\leq$, $\geq$

Inequalities have one of the following:

$<, >, \leq, \geq$

To "solve" means to find all values of the variable for which the statement is true.

The values are called ***Solutions***. The set of all solutions is called the ***solution set***.

Lesson 1.4: Linear Inequalities

Give me three examples of inequalities:

1.

2.

3.

Lesson 1.4: Linear Inequalities

When we find the solution, we can put the answers in **SET NOTATION** (like we've done before), or in something called **INTERVAL NOTATION**.

Practice Set Notation:

EX: Write $x = 5$ in set notation.

EX: Write $x > 5$ in set notation.

Interval Notation

Assume $a<b$ where a and b are real numbers.

Closed Interval:

denoted by **[a, b]**, consists of all real numbers x for which **$a \leq x \leq b$.**

Open Interval:

denoted by **(a, b)**, consists of a ll real numbers x for which **$a < x < b$.**

Half-Open, Half-Closed Intervals:

denoted by (a, b] for all real numbers x for which $a < x \leq b$ and [a, b) for all real numbers x for which $a \leq x < b$.

Interval Notation cont:

If we have (a, b) or (a, b] or [a, b), then:

"a" is called the left end point.

"b" is called the right end point.

Name the end points of the following:

a.) (3, 5)

b.) [-2, 5]

What if we don't have an end point?

For example: $x > 4$

It just goes on forever.... What number is "forever"? Can you think of one?

Write in interval notation:

<u>Lesson 1.4: Linear Inequalities</u>

Intervals including ∞:

(a, b)	{x| a < x < b}	
[a, b]	{x| a $\leq$ x $\leq$ b}	
[a, b)	{x| a $\leq$ x < b}	
(a, b]	{x| a < x $\leq$ b}	
[a, ∞)	{x| x $\geq$ a}	
(a, ∞)	{x| x > a}	
(-∞, a]	{x| x $\leq$ a}	
(- ∞, a)	{x| x $\leq$ a}	
(-∞, ∞)	{x| x is a real number}	

<u>**Lesson 1.4: Linear Inequalities**</u>

Let's do some examples.

Write in interval notation.

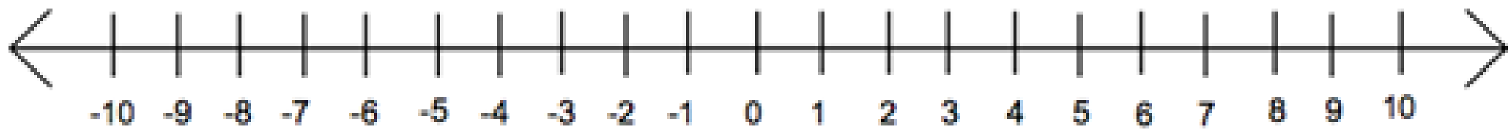
EX 1: $-2 \leq x \leq 4$

EX 2: $1 < x \leq 5$

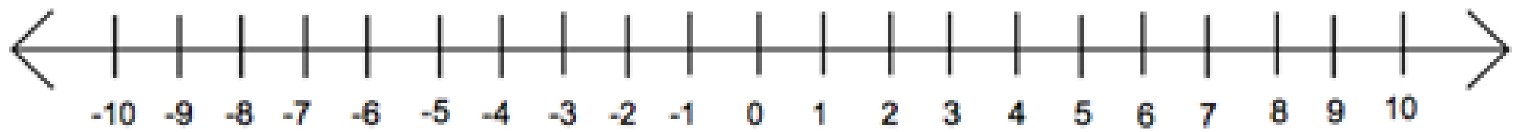
Lesson 1.4: Linear Inequalities

Write in Inequality notation and graph

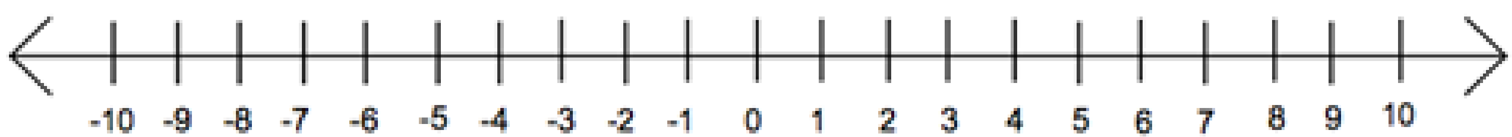
Ex 3: $[-2, 4)$



Ex 4: $(1, 5)$



Ex 5: $[-5, \infty)$



Lesson 1.4: Linear Inequalities

If we have $5 > 3$,

What would happen if we added 6 to both sides?
Would the inequality still be true?

Would the it still be true if we subract 4 from both sides?

If we have $2 < 7$,

Would the inequality still be true IF we add 6 to both sides?

What if we subtract 4 from both sides?

A general way to say this is if we have ***a***, ***b***, and ***c***, then we have

1. if $a > b$, then $a+c > b+c$ and $a-c > b-c$
2. if $a < b$, then $a+c < b+c$ and $a-c < b-c$

Lesson 1.4: Linear Inequalities

If we have $4 > 1$,

What would happen if we multiplied by 6 on both sides? Would the inequality still be true?

Would the it still be true if we divided by 4 on both sides?

If we have $-1 < 3$,

Would the inequality still be true IF we multiplied by 6 on both sides?

What if we divided by 3 on both sides?

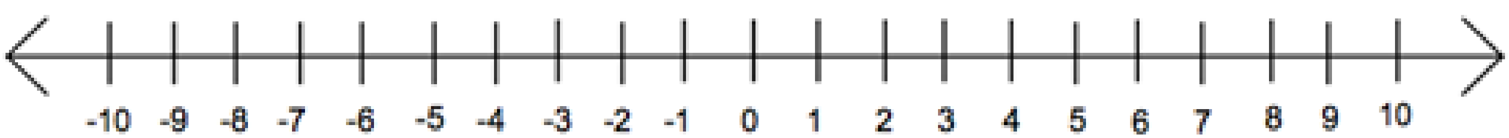
A general way to say this is if we have ***a***, ***b***, and ***c***, then we have

1. if $a > b$, then $a \bullet c > b \bullet c$ and $a/c > b/c$
2. if $a < b$, then $a \bullet c < b \bullet c$ and $a/c < b/c$

Lesson 1.4: Linear Inequalities

Let's solve some examples and then graph them.(Watch out for those negatives! *What should you do if to the </> if you divide or multiply by a negative?)* *Write answers in Set notation and Interval Notation.*

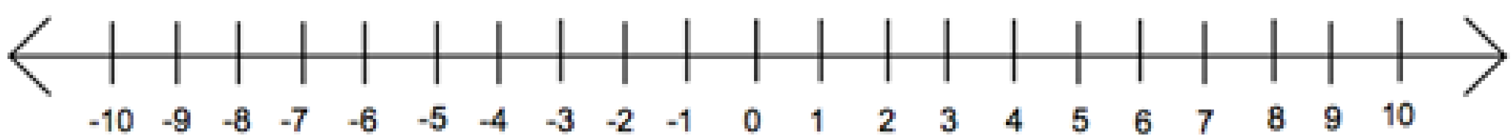
1. $6x + 3 > 5x - 2$



Lesson 1.4: Linear Inequalities

Let's solve some examples and then graph them.(Watch out for those negatives! *What should you do if to the </> if you divide or multiply by a negative?) Write answers in Set notation and Interval Notation.*

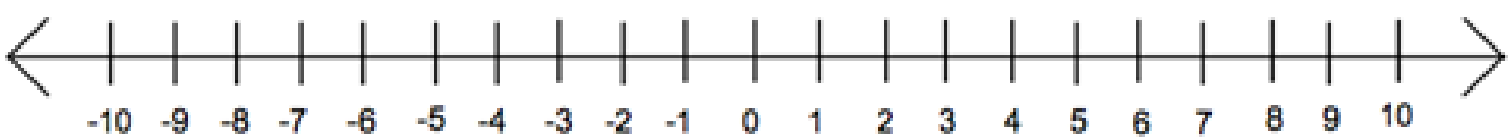
2. $-3x - 4 < 14$



Lesson 1.4: Linear Inequalities

Let's solve some examples and then graph them.(Watch out for those negatives! *What should you do if to the </> if you divide or multiply by a negative?)* *Write answers in Set notation and Interval Notation.*

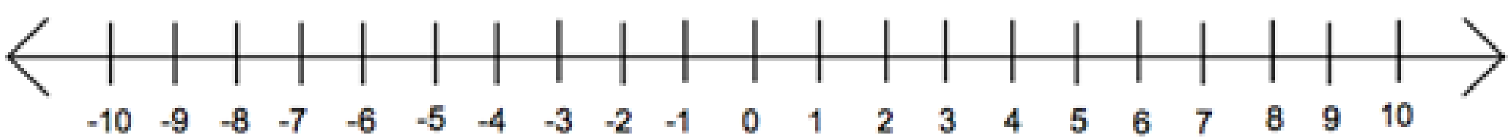
3. $-3(4x + 7) < 21$



Lesson 1.4: Linear Inequalities

Let's solve some examples and then graph them.(Watch out for those negatives! *What should you do if to the </> if you divide or multiply by a negative?)* *Write answers in Set notation and Interval Notation.*

4. $\frac{2x + 1}{3} > \frac{x - 2}{2}$



Homework:

Pg. 97: 4-8 all, 9-27 odds, 32-36 evens,
61, 67, 74

(21 problems)

Homework: Alternative

Pg 97: # 4-8 all, 9-27 odds, 32-36 (evens), 61, 67, 74

Lesson 1.4: Linear Inequalities

Lesson 1.4: Linear Inequalities

Lesson 1.4: Linear Inequalities