Lesson 3: Sections 1.4 & 1.6

By the end of this lesson, you will be able to:

- Write verbal expressions algebraically
- Write algebraic expressions verbally
- Solve equations for one variable
- Solve inequalities for one variable

Verbal and Algebraic Expressions:

Algebraic Expression:
   ex: How would you say $x+2$ verbally?

Verbal Expression:

Verbal Expression:
   ex: How would you write x less than 2 algebraically?

Algebraic Expression:

Mathematical operations in verbal expressions

Addition	Subtraction
plus	minus
more than	less than
the sum of	the difference of
increased by	decreased by
added to	subtracted from
Multiplication	**Division**
the product of	the quotient of
multiplied by	divided by
times	the ratio of
twice	half
Exponents	
squared	
cubed	
to the _____ power	

1. Write an algebraic expression or equation for each verbal expression.

   a. Four times the sum of a number and two

   b. Five increased by three times a number

2. Write a verbal expression for each algebraic expression

   a. $20-y$

   e. $5x$

Solving Equations

1. $3(2a + 25) - 2(a - 1) = 78$

Solving Equations - clear fractions

2. $\dfrac{5}{7}x - 4 = \dfrac{3}{7}x + 1$

Solving Equations - clear fractions

3. $\dfrac{3}{4} - \dfrac{1}{2}(n) = \dfrac{4}{5}$

Solving Equations

4. $-1.6w + 5 = -7.8$

Solving Equations

5. $-4(6y - 5) = 23 - 3(8y + 1)$

Solving Equations - clear fractions

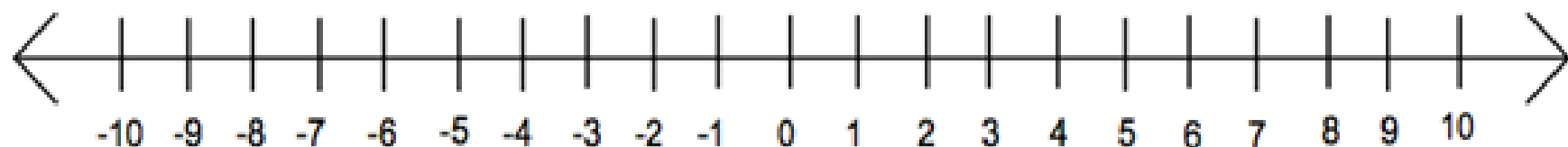6. $-1\frac{3}{4}p = \frac{-5}{8}$

An **Inequality** has a greater than ($>$), greater than or equal to ($\geq$), less than ($<$), or less than or equal to ($\leq$) sign instead of an equal ($=$) sign.

For example:

An Equation is $3x - 4 = 14$
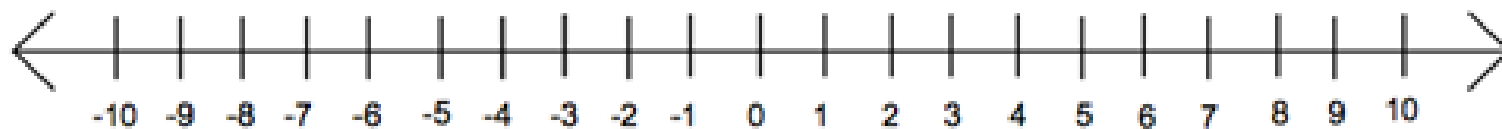
An Inequality is $3x - 4 < 14$

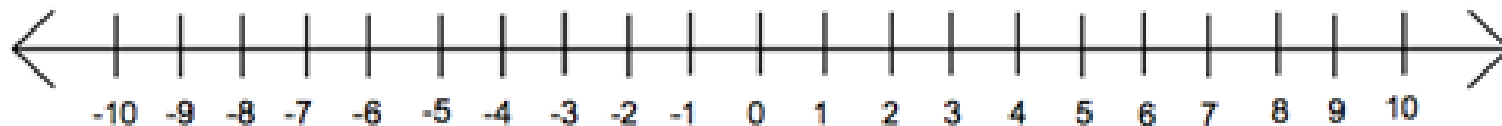**We will be solving for x to find where we can make this sentence be true, and then we will graph the solution.**

Let's start with graphing on a number line.

1. $x > 3$

2. $x < 6$

3. $x \geq -5$

<u>Solving Inequalities</u>

You solve inequalities just like you would solve an equation.

You only have to watch for one thing: **<u>Dividing or Multiplying by a negative number.</u> If you do do this, you need to switch the inequality sign.**

For example: $-3x > 12$ You need to divide by a -3.

This means you need to switch the inequality. It will end up being:

$$x < -4$$

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?)*

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

$$\langle\!\!\!\xleftarrow{\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad\big|\quad}\!\!\!\rangle$$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1   0   1   2   3   4   5   6   7   8   9   10

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?)*
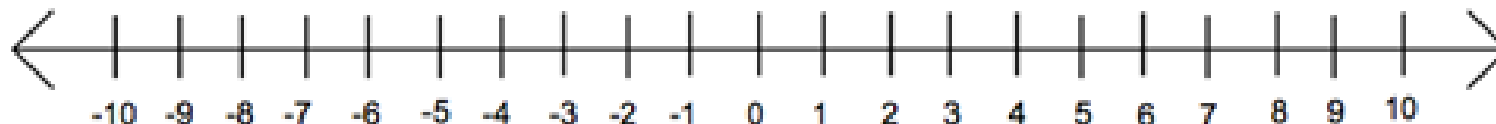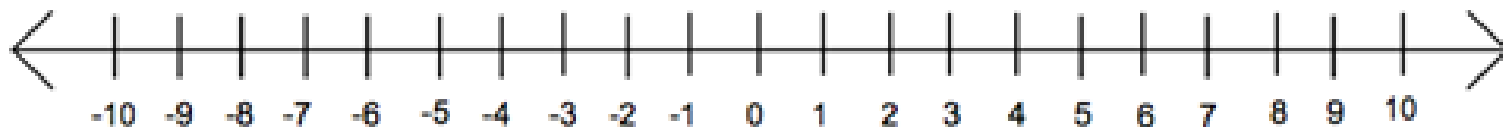
2. -3x - 4 < 14

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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?)*

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

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Can you?

Homework:

Assignment #3: