Algebra 2   Monday, 9/15/14

- Warm-ups: Solve the following:

1. $14y - 3 = 25$

$14y = 28$

$\boxed{y = 2}$

2. $4.2x + 6.4 = 40$

$4.2x = 33.6$

$\boxed{x = 8}$

3. $7w + 2 = 3w - 6$

$4w + 2 = -6$

$4w = -8$

$\boxed{w = -2}$

4. $2(a - 1) = 8a - 6$

$2a - 2 = 8a - 6$

$-2 = 6a - 6$

$4 = 6a$

$\boxed{{}^2/_3 = {}^4/_6 = a}$

Algebra 2   Monday, 9/15/14

- Complete and discuss warm-ups

- Discussion and Notes: **1.5 Solving Inequalities**

- Assignment due Tuesday, 9/16:

  A#1.5 page 37 #10 – 30 evens

Curriculum Night

Tuesday, 9/16/14
6:30 – 8:30 PM

Section 1.5

LEARNING TARGETS

- Solve inequalities with one operation

- Solve multi-step inequalities

Success Criteria:

Q&A, Guided Practice Problems, Homework

Trichotomy Property

- For any two real numbers, a and b, exactly one of the following statements are true:

$$a < b \qquad a = b \qquad a > b$$

Adding the same number to, or subtracting the same number from, each side of an inequality does NOT change the truth of the inequality.

Properties of Inequality

Note: the properties are also true for $\leq, \geq, \neq$

Addition Property of Inequality

Words	Example
For any real numbers, $a, b,$ and c:	$3 < 5$
If $a > b$, then $a + c > b + c$.	$3 + (-4) < 5 + (-4)$
If $a < b$, then $a + c < b + c$.	$-1 < 1$

Subtraction Property of Inequality

Words	Example
For any real numbers, $a, b,$ and c:	$2 > 7$
If $a > b$, then $a - c > b - c$.	$2 - 8 > 7 - 8$
If $a < b$, then $a - c < b - c$.	$-6 > -15$

Example #1: Solve an Inequality Using Addition or Subtraction

- Solve $4x + 7 \leq 3x + 9$. Graph the solution set on a number line.

$$-3x \qquad -3x$$
$$x + 7 \leq 9$$
$$-7 \qquad -7$$
$$\boxed{x \leq 2}$$

Practice – Solve an Inequality Using Addition

- Solve $4w + 19 < 5$. Graph the solution set on a number line.

$$\frac{-19 \quad -19}{4w < -14}$$

$$\boxed{w < -3.5}$$

$-5 \quad -4 \quad -3 \quad -2 \quad -1$

Note: the properties are also true for $\leq, \geq, \neq$

Multiplication Property of Inequality

Words		Examples
For any real numbers, a, b, and c, where:		
c is positive:	If $a > b$, the $ac > bc$	$-2 < 3$
	If $a < b$, then $ac < bc$	$4(-2) < 4(3)$
		$-8 < 12$
c is negative:	If $a > b$, then $ac < bc$	$5 > -1$
	If $a < b$, then $ac > bc$	$(-3)(5) < (-3)(-1)$
		$-15 < 3$

Division Property of Inequality

Note: the properties are also true for $\leq, \geq, \neq$

Words		Examples
For any real numbers, a, b, and c, where:		
	If $a > b$, then $\dfrac{a}{c} > \dfrac{b}{c}$	$-18 < -9$
c is positive:	If $a < b$, then $\dfrac{a}{c} < \dfrac{b}{c}$	$\dfrac{-18}{3} < \dfrac{-9}{3}$
		$-6 < -3$
	If $a > b$, then $\dfrac{a}{c} < \dfrac{b}{c}$	$12 > 8$
c is negative:	If $a < b$, then $\dfrac{a}{c} > \dfrac{b}{c}$	$\dfrac{12}{-2} < \dfrac{8}{-2}$
		$-6 < -4$

Set-builder Notation

- $\{x|x > 9\}$ is read

  "The set of all numbers x such that x is greater than 9."

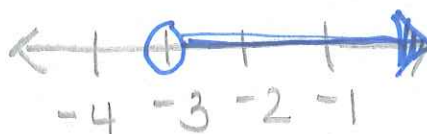 $\{\ \}$ (called braces) denotes "the set of"

  $|$ denotes "such that"

Example #2: Solve an Inequality Using Multiplication or Division

- Solve $-\frac{1}{3}x < 1$. Graph the solution set on a number line.

$$\left(-\tfrac{3}{1}\right)\left(-\tfrac{1}{3}\right)x < 1 \left(-\tfrac{3}{1}\right)$$

$$\boxed{x > -3}$$

-4 -3 -2 -1

Practice – Solve an Inequality Using Multiplication

SHOW YOUR WORK

SHOW YOUR WORK

- Solve $\frac{g}{-3} \geq -9$. Graph the solution set on a number line.

$$(-3)\,\frac{g}{-3} \geq -9\,(-3)$$

$$\boxed{g \leq 27}$$

25 26 27 28

Example #3: Solve a Multi-Step Inequality

- Solve $3(2q - 4) > 6$. Graph the solution set on a number line.

$$\frac{3(2q-4)}{3} > \frac{6}{3}$$

$$2q - 4 > 2$$
$$\underline{+4 \qquad +4}$$
$$2q > 6$$

$$\boxed{q > 3}$$

Solve a Multi-Step Inequality

- Solve $90 \geq 5(2r + 6)$. Graph the solution set on a number line.

$$\frac{90}{5} \geq \frac{5(2r+6)}{5}$$

$$18 \geq 2r + 6$$
$$\underline{-6 \qquad -6}$$
$$12 \geq 2r$$

$$\boxed{6 \geq r}$$

Solve a Multi-Step Inequality

- Solve $-x > \frac{x-7}{2}$. Graph the solution set on a number line.

$$(2)(-x) > \frac{x-7}{2}(2)$$

$$-2x > x - 7$$

$$-x > -7$$

$$\boxed{x < 7}$$

Assignment

A#1.5 page 37
#10 – 30 evens

Due: Tuesday, 9/16/14