April 20th, 2016

Week 18

Mini-Lesson # 1 (TASK 1, 2 & 3)

Jan 21-8:53 AM

Math 9   **Lesson 6.5 (1)**
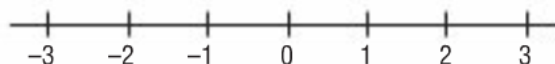
$x > 5$

6.5 Solving Linear Inequalities by Using Multiplication and Division

FOCUS
- Use multiplication and division to solve inequalities.

How does the position of a number on a number line determine whether it is greater than or less than another number?
How does this explain why $2 < 3$ but $-2 > -3$?

```
 +----+----+----+----+----+----+----+
-3   -2   -1    0    1    2    3
```

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April 17, 2014

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In the patterns below, each side of the inequality $12 > 6$ is multiplied or divided by the same non-zero number.

Multiplication Pattern

$12 > 6$ ✓

$12(-3) < 6(-3)$ $-36 < -18$

$12(-2) < 6(-2)$

$12(-1) < 6(-1)$ $-12 \quad -6$

$12(1) > 6(1)$

$12(2) > 6(2)$

$12(3) > 6(3)$

Division Pattern

$12 > 6$ ✓

$12 \div (-3) < 6 \div (-3)$ $-4 \quad -2$

$12 \div (-2) < 6 \div (-2)$ $-6 \quad -3$

$12 \div (-1) < 6 \div (-1)$ $-12 \quad -6$

$12 \div 1 > 6 \div 1$

$12 \div 2 > 6 \div 2$

$12 \div 3 > 6 \div 3$

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Example 1   Solving a One-step Inequality

Solve each inequality. Graph each solution.

a) $-5s \le 25$

$$\frac{-5s}{-5} \le \frac{25}{-5}$$

$s \ge -5$

$s \le 25$

Verify: pick $s = -6$

$s = -10$

$-5s \le 25$

$-5(-4) \le 25$

$30 \le 25$

$50 \le 25$

$s > -5$

Graph $s \ge -5$

choose $s = -4$

0

verify

$-5s \le 25$

$-5(-4) \le 25$?

$20 \le 25$ ✓

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Solving and Graphing Inequalities in One Variable

The Golden Rule of Inequalities
Whenever you multiply or divide both sides of an inequality by a negative number, you must flip the inequality symbol!

1. Get the variable by itself on one side of the inequality.
2. Check the order. $x < 5$ $5 > x$
3. Circle the number on the number line.
4. Open circle or closed circle?
5. Shade your arrow appropriately.

Open Circle	Example: Solve and Graph
$> \quad <$	$5 - 3x \leq 13 + x$
Closed Circle	$-x - 3x \leq 13 - 5$
$\geq \quad \leq$	$-4x \leq 8$
	$\dfrac{-4}{-4} \quad \dfrac{8}{-4}$
	$x \geq -2$

$-2 \qquad 0$

Apr 15-7:39 AM

Connect

We can use a number line to investigate the effect of multiplying and dividing each side of an inequality by the same number.

$-3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6$

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You Try!

b) $7a < -21$

$$\frac{7a}{7} < \frac{-21}{7}$$

$$a < -3$$

-3 0

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You Try!

c) $\frac{y}{-4} > -3$

$$(-4)\frac{y}{-4} > -3(-4)$$

$$y < 12$$

0 12

d) $\frac{k}{3} \geq -2$

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