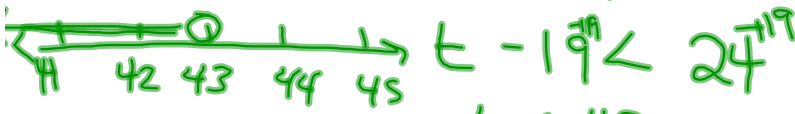


## Corrections to 6.4

9. a)  $4t - 19 < 24 + 3t$

$$4t - 3t - 19 < 24 + 3t - 3t$$



$$t < 43$$

LS      RS

$$4t - 19 < 24 + 3t$$

$$4(0) - 19 < 24 + 3(0)$$

$$0 - 19 < 24 + 0$$

$$-19 < 24 \quad \checkmark$$

Verify  
let  $t = 0$

9b)  $3x < 2x - 7$

$$3x - 2x < 2x - 2x - 7$$

$$x < -7$$



let  $x = -20$

LS      RS

$$3x < 2x - 11$$

$$3(-20) < 2(-20) - 11$$

$$-60 < -40 - 11$$

$$-60 < -51$$

## Section 6.5

# Solving Linear Inequalities by Using Multiplication & Division

### Inequality Symbols

$<$	- Less Than
$>$	- Greater Than
$\leq$	- Less Than or Equal to
$\geq$	- Greater Than or Equal to



## Practice

Place a  $>$  or  $<$  sign that makes the statement true.



$$10(-3) \square 7(-3)$$

$$10(-2) \square 7(-2)$$

$$10(-1) \square 7(-1)$$

$$10(1) \square 7(1)$$

$$10(2) \square 7(2)$$

$$10(3) \square 7(3)$$

$$10 \div (-3) \square 7 \div (-3)$$

$$10 \div (-2) \square 7 \div (-2)$$

$$10 \div (-1) \square 7 \div (-1)$$

$$10 \div (1) \square 7 \div (1)$$

$$10 \div (2) \square 7 \div (2)$$

$$10 \div (3) \square 7 \div (3)$$

# Properties of Inequalities

- 1) When you multiply or divide an inequality by a positive number the inequality remains the same.

Example)  $5 > -1$   
 $5(3) > (-1)(3)$   
 $15 > -3$

- 2) When you multiply or divide an inequality by a "negative number" the inequality must be reversed (switched) in order to remain true.

$$12 > -10$$

$$12 \div (-2) \quad -10 \div (-2)$$

Switch inequality  
since divided by a  
negative

$$12 \div (-2) < -10 \div (-2)$$

$$-6 < 5$$

**NOTE:**

When solving an inequality, we use the same strategy as for solving an equation.

**BUT**

Remember when we divide or multiply by a negative number, we reverse the inequality sign.

# Solving a One-Step Inequality

Solve each inequality. Graph the solution.

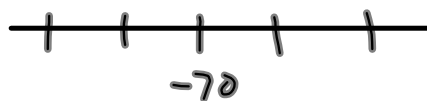
$$1) \frac{x}{5} \leq -2 \quad \times 5$$

$$x \leq -10$$



$$2) \frac{k}{7} \geq 10 \quad \times -7$$

$$k \leq -70$$



$$3) -6r \geq 72$$

$$\frac{-6r}{-6} \geq \frac{72}{-6}$$

$$r \leq -12$$

---

$$4) 3t \leq -52$$

$$\frac{3t}{3} \leq \frac{-52}{3}$$

$$t \leq -\frac{52}{3}$$

---

# Class/Homework

Copy questions from the smartboard and complete. Solve and Graph

1)  $-5 < 2s$

2)  $7a < -21$

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

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

5)  $\frac{y}{-2} \leq 2.5$

6)  $-3x < -12$

7)  $-2x \geq -5$

8)  $-4x - 2 < 10$

9)  $\frac{x}{2} + 3 < 9$

10)  $\frac{x}{2} + 3 \geq 3$

# Solving a Multi-Step Inequality

l)  $-1.6n - 5 > 4.1n + 10.96$

Step 1) Bring all letters to one side and number to the other.

$-1.6n - 5 + 5 > 4.1n + 10.96 + 5$       Add 5 to each side

$-1.6n > 4.1n + 15.96$

$-1.6n - 4.1n > 4.1n - 4.1n + 15.96$       Subtract 4.1n from each side.

$-5.7n > 15.96$

Step 2) Divide each side by the number in front of the letter.

$\frac{-5.7n}{-5.7} < \frac{15.96}{-5.7}$       Divide each side by "-5.7" and since negative reverse the sign.

$n < -2.8$

The solution is all numbers smaller than -2.8

## Check you work

Choose a number less than -2.8.....-3

Substitute  $n = -3$  into the original inequality

See if left hand side is greater than right hand side

$-1.6n - 5 > 4.1n + 10.96$

Left hand side

$-1.6n - 5$

$-1.6(-3) - 5$

$4.8 - 5$

$0.2$

Right hand side

$4.1n + 10.96$

$4.1(-3) + 10.96$

$-12.3 + 10.96$

$-1.34$

$0.2 > -1.34$

IT WORKS



## You Try

Solve each inequality, check your solution and graph

$$2) -15 - 4x \leq 3x + 6$$

$$3) 8m - 2 \geq 13 + 5m$$



# Using an Inequality to Model and Solve a Problem

The 120 Culinary Class decided to raise money by organizing a supper for the seniors home. The cost of preparing the food is \$675 and the students are charging \$9.00 a plate. How many seniors must buy suppers in order to make a profit more than \$765.



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# Class/Homework



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9 (aef)