

Name: KEY!

Hour: _____

Chapter 2/3

Equations & Inequalities

GAGA

=

**$(RAH)^2(AH)^3 +$
 **$[ROMA(1 + MA)] +$
 $(GA)^2 + (OOH)(LA)^2$****

Lesson 2-4: Variables on Both Sides

Pick three problems from "Multi-Step Equations" worksheet to work out as a class below. Show all work and check your answer for each problem!

#3.
$$\begin{array}{r} 8x - 2 = -9 + 7x \\ -7x \quad \quad \quad -7x \\ \hline x - 2 = -9 \\ +2 \quad \quad +2 \\ \hline x = -7 \end{array}$$

check: $8x - 2 = -9 + 7x$
 $8(-7) - 2 = -9 + 7(-7)$
 $-56 - 2 = -9 - 49$
 $-58 = -58 \checkmark$

#12.
$$\begin{array}{r} -(7 - 4x) = 9 \\ -7 + 4x = 9 \\ +7 \quad \quad \quad +7 \\ \hline 4x = 16 \\ \frac{4x}{4} = \frac{16}{4} \\ \hline x = 4 \end{array}$$

check: $-(7 - 4x) = 9$
 $-(7 - 4 \cdot 4) = 9$
 $-(7 - 16) = 9$
 $-(-9) = 9$
 $9 = 9 \checkmark$

#20.
$$\begin{array}{r} -5(1 - 5x) + 5(-8x - 2) = -4x - 8x \\ -5 + 25x + -40x - 10 = -12x \\ -15 + -15x + 15x \\ \hline -15 = -12x \\ \frac{-15}{3} = \frac{-12x}{3} \\ \hline -5 = x \end{array}$$

check:
 $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$
 $-5(1 - 5 \cdot -5) + 5(-8 \cdot -5 - 2) =$
 $-4(-5) - 8(-5)$
 $-5(1 - 25) + 5(40 - 2) = 20 - 40$
 $60 = 60 \checkmark$

5. Solve the equation $A = \frac{1}{2} \cdot b \cdot h$ for b .

$$\frac{A}{\frac{1}{2}} = \frac{\frac{1}{2} \cdot b \cdot h}{\frac{1}{2}}$$

$$\frac{2 \cdot A}{h} = \frac{b \cdot h}{h}$$

$$\boxed{\frac{2 \cdot A}{h} = b}$$

6. Solve the equation $A = \frac{1}{2} \cdot h \cdot (b_1 + b_2)$ for b_1 .

$$\frac{A}{\frac{1}{2}} = \frac{\frac{1}{2} \cdot h \cdot (b_1 + b_2)}{\frac{1}{2}}$$

$$\frac{2 \cdot A}{h} = \frac{h \cdot (b_1 + b_2)}{h}$$

$$\frac{2A}{h} = b_1 + b_2$$

$$\frac{2A}{h} - b_2 = b_1$$

$$\boxed{\frac{2A}{h} - b_2 = b_1}$$

7. The formula for a person's typing speed is shown below, where s is speed in words per minute, w is the number of words typed, e is the number of errors, and m is the number of minutes typing. Solve for e .

$$m \cdot s = \frac{w - 10e}{m} \cdot m$$

$$m \cdot s = w - 10e$$

$$m \cdot s - w = -10e$$

$$\frac{m \cdot s - w}{-10} = \frac{-10e}{-10}$$

$$\boxed{\frac{m \cdot s - w}{-10} = e}$$

Lesson 3-1: Graphing & Writing Inequalities

Vocabulary

Inequality: a statement that 2 quantities are NOT equal.

Quantities are compared using the following signs...

	$<$	$>$	\leq	\geq	\neq
Example	$A < B$	$A > B$	$A \leq B$	$A \geq B$	$A \neq B$
Words	A is less than B	A is greater than B	A is less than or = to B	A is greater than or = to B	A does not = B

Solution of an Inequality: any value that makes an inequality true.

An inequality like $3 + x < 9$ has too many solutions to list. You can use a graph on a number line to show all of the solutions to an inequality.

The solutions are shaded and an arrow shows that the solutions continue past those shown on the graph.

	● <i>includes # (\leq or \geq)</i>	○ <i>doesn't include # ($>$ or $<$)</i>
Example		
Words	$x \geq -2$; x is greater than or = to -2	$x > -2$; x is greater than -2

"No more than" means "less than or equal to"

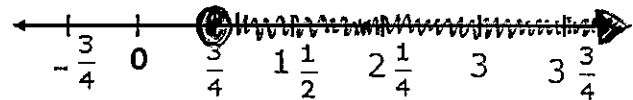
"At least" means "greater than or equal to"

Words	Algebra	Graph
All real numbers less than 5	$x < 5$	
All real numbers greater than -1	$x > -1$	
All real numbers less than or equal to 1/2	$x \leq \frac{1}{2}$	
All real numbers greater than or equal to 0	$x \geq 0$	

Practice

Graph the following inequalities.

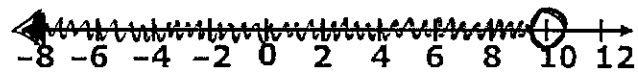
1. $m \geq \frac{3}{4}$



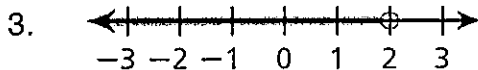
2. $t < 5(-1 + 3)$

$t < 5(2)$

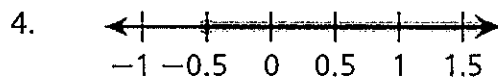
$t < 10$



Write the inequality shown by each graph.



$x < 2$



$x \geq -0.5$

5. Ray's dad told him not to turn on the AC unless the temperature was at least ^{greater than} 85°F. Write an inequality for the temperatures at which Ray can turn on the AC. Graph the solutions.

$t \geq 85^\circ$

* If you \times or \div by a negative... flip your sign!

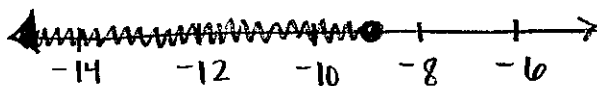
Lesson 3-4: Two-Step & Multi-Step Inequalities

Pick three problems from "Two-Step Equations" worksheet to work out as a class below. Show all work and check your answer for each problem!

$$\#2. \quad \frac{m}{3} - 3 \leq -6$$
$$\quad \quad \quad +3 \quad \quad +3$$

$$3 \cdot \frac{m}{3} \leq -3 \cdot 3$$

$$m \leq -9$$

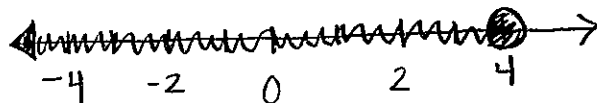


$$\#8. \quad -3(r-4) \geq 0$$

$$-3r + 12 \geq 0$$
$$\quad \quad \quad -12 \quad \quad -12$$

$$-3r \geq -12$$
$$* \frac{-3r}{-3} \geq \frac{-12}{-3} *$$

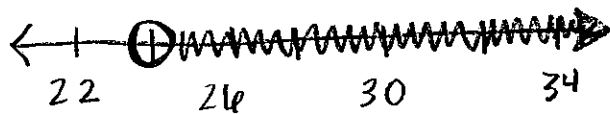
$$r \leq 4$$



$$\#12. \quad \frac{-9 + a}{15} > 1 \cdot 15$$

$$-9 + a > 15$$
$$+9 \quad \quad +9$$

$$a > 24$$



* If you \times or \div by a negative... flip your sign!

Lesson 3-5: Variables on Both Sides of Inequalities

Pick three problems from "Multi-Step Equations" worksheet to work out as a class below. Show all work and check your answer for each problem!

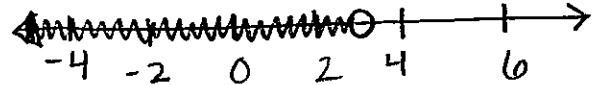
#6. $-3 - 6(4x + 6) > -111$

$$\textcircled{-3} - 24x - \textcircled{36} > -111$$

$$\begin{array}{r} -24x - 39 > -111 \\ +39 \quad +39 \end{array}$$

$$\begin{array}{r} -24x > -72 \\ \hline * -24 \quad * -24 \end{array}$$

$$\boxed{x < 3}$$



#8. $-138 \geq -6(6b - 7)$

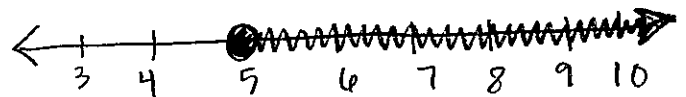
$$\begin{array}{r} -138 \geq -36b + 42 \\ -42 \quad -42 \end{array}$$

$$\begin{array}{r} -180 \geq -36b \\ \hline * -36 \quad * -36 \end{array}$$

$$\boxed{5 \leq b}$$

\Downarrow

$$b \geq 5$$



Flip \rightarrow