Key

Algebra 1
Unit 3, Lesson 2 Notes
Solving Inequalities with Variables on Both Sides

Solving and Graphing Inequalities in One Variable

The Golden Rule of Inequalities (flip-flop)

If you x or ÷ by a negative #, you need to "flip-flop" the inequality sign!

1.	Get the variable by itself on 1 side of the inequality sign.
2.	Check the order! Variable → Sign → Constant
3.	Circle the # on the # line
4.	Open or closed circle?
5.	Shade appropriately

Open Circle

$<$ $>$ $\neq$

Closed Circle

$\leq$ $\geq$

Example: Solve and Graph

$$5 - 3x \leq 13 + x$$

$+3x \quad +3x$

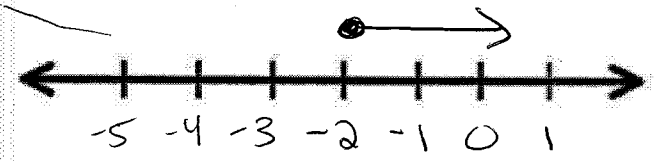
$$5 \leq 13 + 4x$$

$-13 \quad -13$

$$\frac{-8}{4} \leq \frac{4x}{4}$$

$x \geq -2$

$$-2 \leq x$$

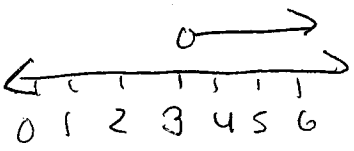


Examples: Solve and graph.

1) $4 - 2m > 7 - 3m$

$4 + m > 7$

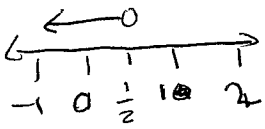
$m > 3$



2) $-10p > 6p - 8$

$-16p > -8$

$p < \frac{1}{2}$

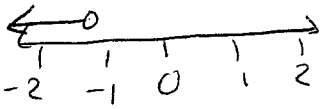


3) $8n - 2 > 17n + 9$

$-11 > 9n$

$\frac{-11}{9} > n$

$n < -\frac{11}{9}$ OR $-1\frac{2}{9}$

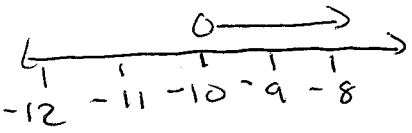


4) $-\frac{2}{3}d - 2 < \frac{1}{3}d + 8$

$-2 < d + 8$

$-10 < d$

$d > -10$

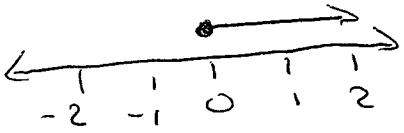


5) $3(S - 4) \geq 2(S - 6)$

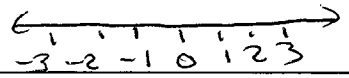
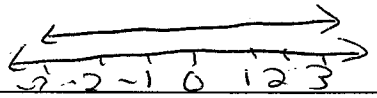
$3S - 12 \geq 2S - 12$

$3S \geq 2S$

$S \geq 0$



What about these? Solve and graph if possible.

$-6(1 + 7x) + 7(1 + 6x) \leq -2$	$-2(5 + 6x) < 6(8 - 2x)$
$-6 - 42x + 7 + 42x \leq -2$	$-10 - 12x < 48 - 12x$
$1 \leq -2$	$-10 < 48$
no solution	all real #'s
	

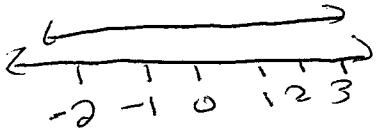
A few more...

1) $3p - 5 > 2p + p - 7$

$3p - 5 > 3p - 7$

$-5 > -7$

all real #'s



2) $6(x + 3) < 5x + 18 + x$

$6x + 18 < 6x + 18$

$0 < 0$

no solution