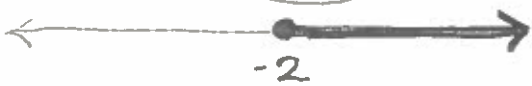
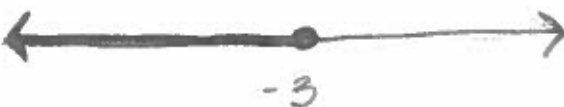


Solving Inequalities with Variables on Both Sides

<p><u>Ex. 1</u></p> $\begin{array}{r} 4x - 2 < 2x - 6 \\ -2x \quad -2x \\ \hline 2x - 2 < -6 \\ +2 \quad +2 \\ \hline 2x < -4 \\ \frac{2x}{2} < \frac{-4}{2} \\ x < -2 \end{array}$	<p><u>Steps</u></p> <ol style="list-style-type: none"> 1) Get rid of the variables on ONE side. Do the SAME to the other side. 2) Solve by using inverse operations. 3) Keep/reverse symbol. 4) Graph your solution. 	<p><u>Analyze Process</u></p> <p>Why do we subtract 2x from both sides instead of add 2x and 4x together?</p> <ul style="list-style-type: none"> • Inverse operations 2x Cancels w/ -2x • cannot combine across the symbol!
<p><u>Ex. 2A - Left Side Method</u></p> $\begin{array}{r} 5x - 3 > 8x - 6 \\ -8x \quad -8x \\ \hline -3x - 3 > -6 \\ +3 \quad +3 \\ \hline -3x > -3 \\ \frac{-3x}{-3} > \frac{-3}{-3} \\ x < 1 \end{array}$	<p><u>Ex. 2B - No Negatives Method</u></p> $\begin{array}{r} 5x - 3 > 8x - 6 \\ -5x \quad -5x \\ \hline -3 > 3x - 6 \\ +6 \quad +6 \\ \hline 3 > 3x \\ \frac{3}{3} > \frac{3x}{3} \\ 1 > x \\ x < 1 \end{array}$	<p><u>Analyze Process</u></p> <p>Which method do you prefer? Why? I really doesn't matter b/c I can do both ways</p>

Solve and Graph the Inequality

<p><u>You Try 3</u></p> $\begin{array}{r} 6x + 3 \leq 1x - 7 \\ -6x \quad -6x \\ \hline 3 \leq -5x - 7 \\ +7 \quad +7 \\ \hline 10 \leq -5x \\ \frac{10}{-5} \leq \frac{-5x}{-5} \\ -2 \leq x \\ x \geq -2 \end{array}$ 	<p><u>You Try 4</u></p> $\begin{array}{r} 4x - 1 \geq 6x + 5 \\ -6x \quad -6x \\ \hline -2x - 1 \geq +5 \\ +1 \quad +1 \\ \hline -2x \geq 6 \\ \frac{-2x}{-2} \geq \frac{6}{-2} \\ x \leq -3 \end{array}$ 
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Special Solutions

Ex. 5

$$2(3x - 1) > 5x - 5 + x$$

$$6x - 2 > 6x - 5$$

$$\begin{array}{r} -6x \quad -6x \\ \hline \end{array}$$

$$-2 > -5$$

TRUE!

all real
#s

Steps

- 1) Simplify first.
- 2) Solve by getting rid of the variable on ONE side. Do the SAME to the other side.
- 3) Decide if your statement is ALWAYS true or ALWAYS false.
- 4) Describe your solution set - ALL REAL NUMBERS or NO SOLUTION.

Analyze Process

- 1) What simplify processes do you use?
left: Distributive
right: Combine.
- 2) What happens when you try to solve? Variables Cancel on both sides.
- 3) What is your solution set? Why? any # when you substitute will give a true statement

Ex. 6

$$4 - (8x + 7) > 2 - 8x$$

$$4 - 8x - 7 > 2 - 8x$$

$$\begin{array}{r} -3 - 8x > 2 - 8x \\ +8x \quad +8x \\ \hline \end{array}$$

$$-3 > 2$$

FALSE!

NO SOLUTIONS

You Try 7

$$3x - 3 \geq 5x - 6 - 2x$$

$$\begin{array}{r} 3x - 3 \geq 5x - 6 \\ -3x \quad -3x \\ \hline \end{array}$$

$$-3 \geq -6$$

TRUE
all real
#s

You Try 8

$$\begin{array}{r} 2(x + 1) - 6x > -4x + 5 \\ 2x + 2 - 6x > -4x + 5 \\ -4x + 2 > -4x + 5 \\ +4x \quad +4x \\ \hline \end{array}$$

$$2 > 5$$

FALSE!
NO SOLUTIONS

Key Ideas

- When you have variables on both sides, get rid of the variables on one side.
- Then do the SAME to the other side.
- If your variables cancel out and you have a TRUE statement, your solution is: all real #s
- If your variables cancel out and you have FALSE statement, your solution is: NO SOLUTIONS