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# **Exploration: Graphing Inequalities 3**

## Part I. Introduction

In this exploration you will solve inequalities by multiplication and division.

- □ If each side of a true inequality is multiplied or divided by the same *positive* number, the resulting inequality is also true.
- □ If each side of a true inequality is multiplied or divided by the same *negative* number, the direction of the inequality symbol must be reversed so that the resulting inequality will also be true.

Inequality:

x>2

enter/return key

Notice the inequality input box.Enter an inequality and hit the

- The equation will be graphed

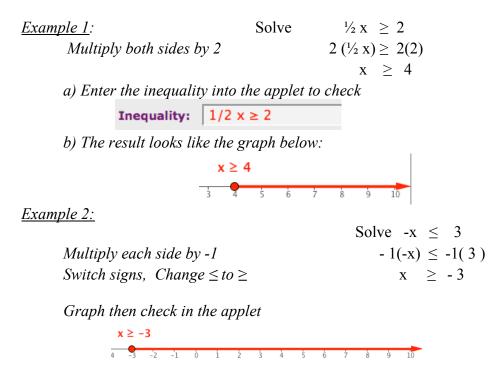
#### Directions:

### Step 1: Launch the Inequalities on the Number Line - 0 applet using Firefox.

	Next Activity Menu
Inequalities on the Number Line - 0 Book Goods as increasing the surplexity	Back to GeoGebra at Math247
<ol> <li>Type or paste an inequality in x in the box. Ht Enter.</li> <li>You can type &lt;= for s and &gt;= for s . Values on the red ray make the inequality "true".</li> </ol>	
Inequality: x>2 Other examples: x+3s5, 2x+1>4, 3>=4x/5-11/5	© x > 2
<ol> <li>To change the view, click on the Move tool click and drag the number line as desired.</li> </ol>	
An open endpoint means NO "=" in the inequality.	
<ol> <li>Find the value of any point on the red ray. On a piece of paper, substitute this value for x into the inequality. The inequality should be "true".</li> </ol>	Warry thanks to mathematic and pirran and to e.b. (JE: Created with Geodelate: Still testing - piecese write.
<ol> <li>Find the value of any point NOT on the red ray. On a piece of paper, substitute this value for x into the inequality. The inequality should be "false".</li> </ol>	
To start over, enter a new inequality and hit Enter.	

Step 2: Solve the given inequality then graph.

## Step 3: Check your solution and graph using the applet



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<u>Example 3</u> :	Solve $3x \leq 12$
Divide both sides by 3	$(3 x) \div 3 \le 12 \div 3$
	$x \leq 4$
a) Enter the inequality in	to the applet to check
b) The result looks like th	e graph below: Inequality: 3x ≤ 12
	x ≤ 4
-9	-'8 -'7 -'6 -'5 -'4 -'3 -'2 -'1 0 1 2 3 4 5
<u>Example 4:</u>	
	Solve $-2x > 8$
Divide each side by -2	$-2x \div -2 > 8 \div -2$
Switch signs, Change $\leq t$	$o \ge x < -4$
Graph than aback in the	unlat
Graph then check in the c	иррієї x < -4
	-9 -8 -7 -6 -5 -4 -3 -2

### Part II: Solve, Graph, & Check

Solve the inequality provided. Predict the graph. Draw the graph of your prediction on the number line provided. Check your answer by entering the inequality in the entry box and hitting return. Compare the result to your prediction.

Sol	ve the Inequality	Gra	aph	the	Sol	utio	n															
1)	$1/5 x \le 1$	•	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	i	2	-33	4	5	6	7	8	9	10
2)	-x > 8	•	-9	-8	-7	-6	-5	-4	-3	-2	-1	ò	ì	2	- 77	4	5	6	7	- 80	9	10
3)	$1/3 x \ge -1$	4	-9	-8	-'7	-6	-'5	-4	-3	-2	-'1	ò	i	2	-3	4	5	6	ż	-8	9	10
4)	$-\frac{1}{2} x \leq -2$	4	-9	-8	-7	-6	-5	-4	-3	-2	-1	ò	i	2	- 73	4	5	6	7	- 80	9	10

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Solv	e the Inequality	Gra	ph 1	the	Solı	utio	n															
5)	$4_{\rm X} > 8$	4-	-9	-8	-'7	-6	-5	-4	-3	-2	-1	ò	i	2	- 171	4	5	6	7	- 8	9	10
6)	-3x ≥ -6	4-	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	- 3	4	5	6	7	- 8	ģ	i0
7)	2 < -x	•-	-9	-8	-7	-6	-5	-4	-3	-2	-1	ò	1	2	-77	4	5	6	7	- 8	9	io
8)	5x < 3x - 8	•	-9	-8	-7	-6	-5	-4	-3	-2	-1	ò	i	2	3	4	5	6	7	8	9	io ►
9)	$6x - 2 \ge 4x + 1$	•	-9	-8	-7	-6	-5	-4	-3	-2	-1	ò	ì	2	-77	4	-5	6	7	-8	ģ	10
10)	8 + 2x < 12	•	-'9	-8	-7	-6	-5	-4	-3 -3	-2	-1	ò	ì	2	- 171	4	-5	Ġ	Ż	- 8	ġ	i0

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