

1-5 Solving Inequalities.notebook

1-5: Solving Inequalities

Objective for the day: Students will solve, graph and write inequalities.

Key Vocab:

Compound inequality: two inequalities joined together with the word *and* or the word *or*

Key Concept Writing and Graphing Inequalities		
Inequality	Word Sentence	Graph
$x > 4$	x is greater than 4.	
$x \geq 4$	x is greater than or equal to 4.	
$x < 4$	x is less than 4.	
$x \leq 4$	x is less than or equal to 4.	

I DO:

Example 1

What inequality represents the sentence, "The product of 7 and a number is no more than 50?"

$$7x \leq 50$$

WE DO:

What inequality represents the sentence, "The product of 6 and a number is less than 20"?

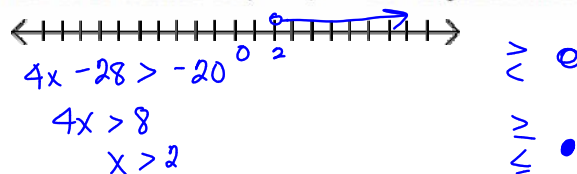
$$6x < 20$$

Properties Properties of Inequalities		
Let a , b , c , and d represent real numbers.		
Property	Definition	Example
Transitive	If $a > b$ and $b > c$, then $a > c$.	$5 > 3$ and $3 > 1$, so $5 > 1$
Addition	If $a > b$, then $a + c > b + c$.	$4 > 2$, so $4 + 1 > 2 + 1$
Subtraction	If $a > b$, then $a - c > b - c$.	$7 > 4$, so $7 - 3 > 4 - 3$
Multiplication	If $a > b$ and $c > 0$, then $ac > bc$.	$6 > 5$ and $3 > 0$, so $6(3) > 5(3)$
	If $a > b$ and $c < 0$, then $ac < bc$.	$3 > 2$ and $-4 < 0$, so $3(-4) < 2(-4)$
Division	If $a > b$ and $c > 0$, then $\frac{a}{c} > \frac{b}{c}$.	$9 > 3$ and $3 > 0$, so $\frac{9}{3} > \frac{3}{3}$
	If $a > b$ and $c < 0$, then $\frac{a}{c} < \frac{b}{c}$.	$12 > 6$ and $-6 < 0$, so $\frac{12}{-6} < \frac{6}{-6}$

I DO:

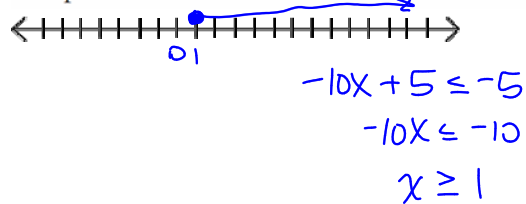
Example 2

What is the solution of $4(x - 7) > -20$? Graph the solution.



WE DO:

What is the solution of $-5(2x - 1) + 3 \leq -2$? Graph the solution.



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I DO:

Example 3

Plumber A charges \$75 for a service charge and \$40 per hour. Plumber B charges \$50 per hour but no service charge. How many hours must a plumbing job last for Plumber A to cost less than Plumber B?

$$75 + 40x < 50x$$

$$75 < 10x$$

WE DO:

$$7.5 < x$$

Do you UNDERSTAND? Eastside Gym charges a \$60 initial fee and \$28.50 per month. Valley Gym charges \$36 per month, and no initial fee. After how many months of use would Eastside cost less than Valley?

$$60 + 28.5x < 36x$$

$$60 < 7.5x$$

$$8 < x$$

months

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