

MATH 1010 ~ Intermediate Algebra Chapter 2: LINEAR EQUATIONS AND INEQUALITIES

Section 2.4: Linear Inequalities

Objectives:

- ✧ Sketch the graph of inequalities on a number line.
- ✧ Use properties of inequalities to solve linear inequalities.
- ✧ Solve compound inequalities.
- ✧ Solve application problems involving inequalities.

Sketch the solution on the number line:

$$-3 \leq x < 2$$

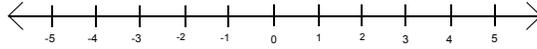
INTERVALS ON A REAL NUMBER LINE

<i>Notation</i>	<i>Inequality</i>	<i>Graph</i>
[a,b]	$a \leq x \leq b$	
(a,b)		
[a,b)		
(a,b]		
[a,∞)		
(a,∞)		
(-∞,b]		
(-∞,b)		
(-∞,∞)		

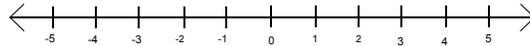
① EXAMPLE:

Graph each inequality.

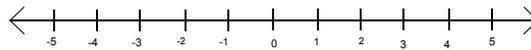
a) $-2 \leq x < 3$



b) $x \geq -1$ or $x < -2$



c) $x > 1$



Properties of Inequalities

1. *Addition and Subtraction Properties*

2. *Multiplication and Division Properties: Positive Quantities*

3. *Multiplication and Division Properties: Negative Quantities*

4. *Transitive Property*

SOLVING LINEAR INEQUALITIES

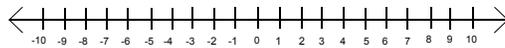
① EXAMPLE:

$$3x + 12 < x + 18$$



②

$$-7 \leq 5x - 2 < 8$$



③

$$-3x + 6 \leq 2 \quad \text{or} \quad -3x + 6 \geq 7$$

④

$$9 - x \leq 3 + 2x \quad \text{and} \quad 3x - 7 \leq -22$$

