

Section 3.4: Solving Linear Inequalities

Objectives

- Understand and use **set-builder notation**.
- Understand and use **interval notation**.
- Solve linear inequalities.
- Solve compound inequalities.

Instruct

1. On a number line graph, what **ALGEBRAIC NOTATION** is used to indicate a) an open-interval and b) a half-open interval?
2. We will use the symbol for infinity, ∞ and $-\infty$, regularly. It is important to understand that ∞ is not a number, but rather is used to _____.

Below is an important screen shot from Instruct. Study this page, write notes on it, refer to it practice to understand all the notations and vocabulary.

Types of Intervals and Interval Notation			
Type of Interval	Algebraic Notation	Interval Notation	Graph
Open Interval	$a < x < b$	(a, b)	
Closed Interval	$a \leq x \leq b$	$[a, b]$	
Half-Open Interval	$\begin{cases} a \leq x < b \\ a < x \leq b \end{cases}$	$[a, b)$	
		$(a, b]$	
Open Interval	$\begin{cases} x > a \\ x < b \end{cases}$	(a, ∞)	
		$(-\infty, b)$	
Half-Open Interval	$\begin{cases} x \geq a \\ x \leq b \end{cases}$	$[a, \infty)$	
		$(-\infty, b]$	

3. Solving Linear Inequalities is very similar to solving linear equations with one important exception, which is...

4. Solve the following inequality and graph the solution set (carefully follow one of the examples in Hawkes): $2x + 3 \leq 5$

5. The following inequality is in **ALGEBRAIC NOTATION** (carefully follow one of the examples in Hawkes): $-3 \leq x < 2$

a) Write this inequality in "interval notation".

b) Graph this inequality on the number line below.

