

Mod 1: Lesson 1.1
Day 1 Writing set/interval notation for inequalities (Domain)

Objective: We will be able to write the domain of the linear inequality in set notation and interval notation.

Interval is a part of a number line without any breaks.
Finite interval has two endpoints, which may or may not be included in the interval.
Infinite interval is unbounded at one or both ends

Description of Interval	Type of Interval	Inequality	Set Notation	Interval notation
All real numbers from a to b , including a and b	Finite	$a \leq x \leq b$	$\{x a \leq x \leq b\}$	$[a, b]$
All real numbers greater than a	Infinite	$x > a$	$\{x x > a\}$	$(a, +\infty)$
All real numbers less than or equal to a	Infinite	$x \leq a$	$\{x x \leq a\}$	$(-\infty, a]$

For set notation, the vertical bar means "such that," so you read $\{x | x \geq 1\}$ as "the set of real numbers such that x is greater than or equal to 1."

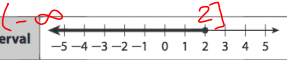
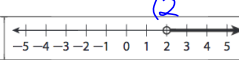
For interval notation, do the following:

- Use a square bracket to indicate that an interval includes an endpoint and a parenthesis to indicate that an interval doesn't include an endpoint.

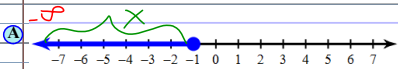
Use [or] for closed dots $\rightarrow \leq, \geq$
Use (or) for open dots $\rightarrow <, >$

- For an interval that is unbounded at its positive end, use the symbol for positive infinity, $+\infty$
 - For an interval that is unbounded at its negative end, use the symbol for negative infinity, $-\infty$
- Always use a parenthesis with positive or negative infinity

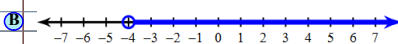
1 Complete the table by writing the finite interval shown on each number line as an inequality, using set notation, and using interval notation.

Infinite Interval		
Inequality	$x \leq 2$	$x > 2$
Set Notation	$\{x x \leq 2\}$	$\{x x > 2\}$
Interval Notation	$(-\infty, 2]$	$(2, \infty)$

2 U-TRY Write each number line as an inequality, using set notation, and using interval notation.



IN: $(-\infty, -1]$ SN: $\{x | x \leq -1\}$



$(-4, \infty)$ $\{x | x > -4\}$

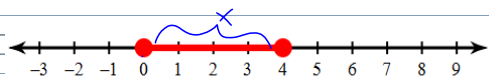
4 Write each number line as an inequality, using set notation, and using interval notation.



"or" means "union" and we use "U"
IN: $(-\infty, 0) \cup (3, \infty)$

SN: $\{x | x < 0 \text{ or } x > 3\}$

- 5 Write each number line as an inequality, using set notation, and using interval notation.



IN: $[0, 4]$

and

SN: $\{x \mid 0 \leq x \leq 4\}$