

## Preliminaries and Objectives

## Interval Notation



Preliminaries:

- Inequalities on the real number line

Objectives:

- Express portions of the real number line using interval notation.

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Interval Notation

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## Interval Notation

Inequality	Interval Notation
$3 < x < 5$	



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## Interval Notation

Inequality	Interval Notation
$3 < x < 5$	$(3, 5)$



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## Interval Notation

Inequality	Interval Notation
$3 < x < 5$	$(3, 5)$
$3 \leq x \leq 5$	$[3, 5]$



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## Interval Notation

Inequality	Interval Notation
$3 < x < 5$	$(3, 5)$
$3 \leq x \leq 5$	$[3, 5]$
$x \leq 5$	$(-\infty, 5]$

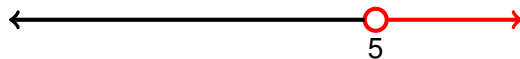


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Interval Notation

## Interval Notation

Inequality	Interval Notation
$3 < x < 5$	$(3, 5)$
$3 \leq x \leq 5$	$[3, 5]$
$x \leq 5$	$(-\infty, 5]$
$x > 5$	$(5, \infty)$



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Interval Notation

## Interval Notation

Inequality	Interval Notation
$3 < x < 5$	$(3, 5)$
$3 \leq x \leq 5$	$[3, 5]$
$x \leq 5$	$(-\infty, 5]$
$x > 5$	$(5, \infty)$
$3 < x \leq 5$	$(3, 5]$



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Interval Notation

## Interval Notation

Inequality	Interval Notation
$3 < x < 5$	$(3, 5)$
$3 \leq x \leq 5$	$[3, 5]$
$x \leq 5$	$(-\infty, 5]$
$x > 5$	$(5, \infty)$
$3 < x \leq 5$	$(3, 5]$
all real numbers	$(-\infty, \infty)$



## Recap

- Rounded parentheses are used when the endpoints are not included  $(a, b) \iff a < x < b$
- Pointed brackets are used when the endpoints are included  $[a, b] \iff a \leq x \leq b$
- $\pm\infty$  are used when only one inequality is present
- $\infty$  is never used with brackets [ ]

## Interval Notation

Inequality	Interval Notation
$a < x < b$	$(a, b)$
$a \leq x \leq b$	$[a, b]$
$a < x \leq b$	$(a, b]$
$a \leq x < b$	$[a, b)$
$a < x$	$(a, \infty)$
$x < b$	$(-\infty, b)$
$a \leq x$	$[a, \infty)$
$x \leq b$	$(-\infty, b]$
all real numbers	$(-\infty, \infty)$