Interval Notation

Preliminaries and Objectives

Preliminaries:

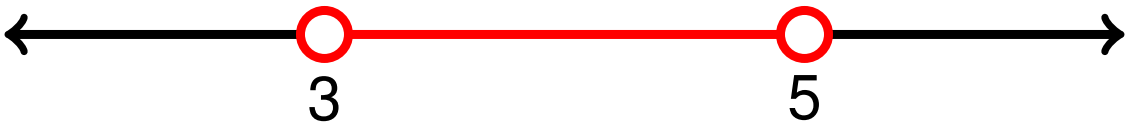
- Inequalities on the real number line

Objectives:

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

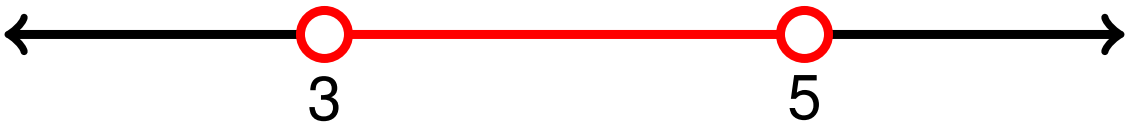
Interval Notation

Inequality	Interval Notation
$3 < x < 5$	



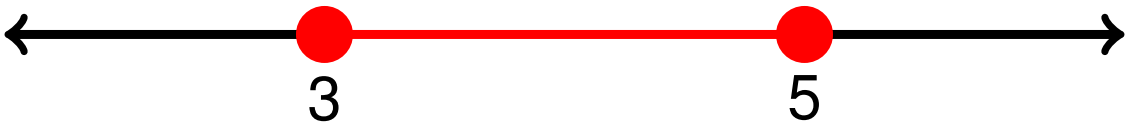
Interval Notation

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



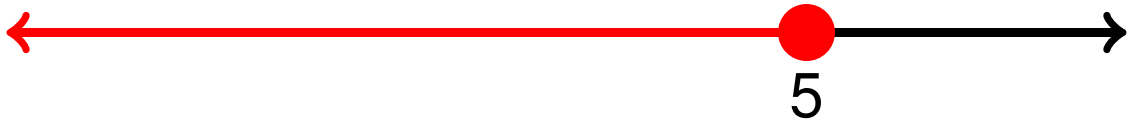
Interval Notation

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



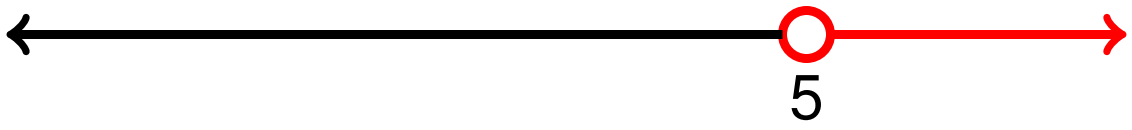
Interval Notation

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



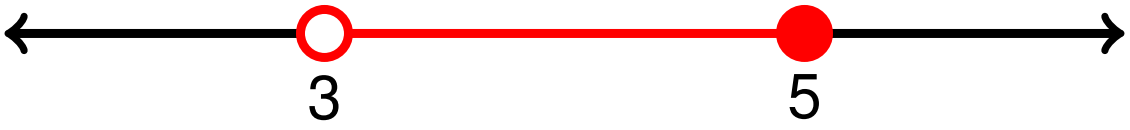
Interval Notation

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



Interval Notation

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



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