Interval Notations

Two Endpoints

Note: > or < graph as open circles or ( ) in interval notation – endpoint is not included
    ≥ or ≤ graph as closed circles or [ ] in interval notation – endpoint is included

Set Builder Notation	Interval Notation	Interval Type
$\{\ x\ \mid\ a \leq x \leq b\} = $	$[a, b]$	Closed
$\{\ x\ \mid\ a \leq x < b\} = $	$[a,b)$	closed-open
$\{\ x\ \mid\ a < x \leq b\} = $	$(a, b]$	open-closed
$\{\ x\ \mid\ a < x < b\} = $	(a,b)	Open

One Endpoint

Note: Parentheses ( ) are always used with $-\infty$ or $+\infty$

Set Builder Notation	Interval Notation
$\{\ x\ \mid\ x \geq a\ \} = $	$[a, +\infty)$
$\{\ x\ \mid\ x > a\ \} = $	$(a, +\infty)$
$\{\ x\ \mid\ x \leq a\} = $	$(-\infty, a]$
$\{\ x\ \mid\ x < a\} = $	$(-\infty, a)$
(all real numbers) R $= $	$(-\infty, +\infty)$

Combining Two Intervals

Two or more intervals that do not overlap are combined by the union symbol $\bigcup$

Example: $(-\infty, -11] \cup [-7, 6] \cup (9, \infty)$

Notice that each interval is disjoint or has endpoints that do not overlap…