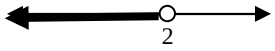
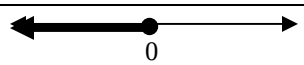
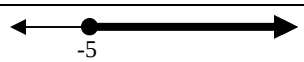
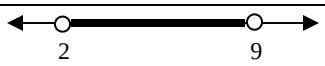
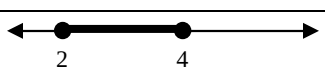
Inequalities

Inequalities can be expressed in three different ways.

1. **Using an inequality symbol** ($<$, $>$, $\leq$, or $\geq$)
2. **Using a number line graph**
3. **Using interval notation**

A Comparison of All Three Methods

Inequality Symbol	Number Line Graph	Interval Notation
$x < 2$		$(-\infty, 2)$
$x > -3$		$(-3, \infty)$
$x \leq 0$		$(-\infty, 0]$
$x \geq -5$		$[-5, \infty)$
$2 < x < 9$		$(2, 9)$
$-3 \leq x < 2$		$[-3, 2)$
$5 < x \leq 8$		$(5, 8]$
$2 \leq x \leq 4$		$[2, 4]$
No numbers or No solution		$\varnothing$
All numbers		$(-\infty, \infty)$

A parenthesis is the same as an 'open circle' and a bracket is the same as a 'closed circle' on a number line.

When writing with interval notation, always write the smaller value first. A parenthesis means the value of *x* can become very close to that number, but will never exactly equal that number. A bracket means the value of *x* can equal that number. Never use a bracket with positive or negative infinity.