Confusing Notations

Some notations look very similar to others, so context is important.

(5, 9)   Is this an ordered pair or an interval?

Without the context, you can't tell.

Ordered pairs — These are addresses on a grid.

(input, output)

(x, y)

(x, f(x))

Examples:
(-3,-2)
(-2,3)
(1,2)
(2, 1)
(2,-3)
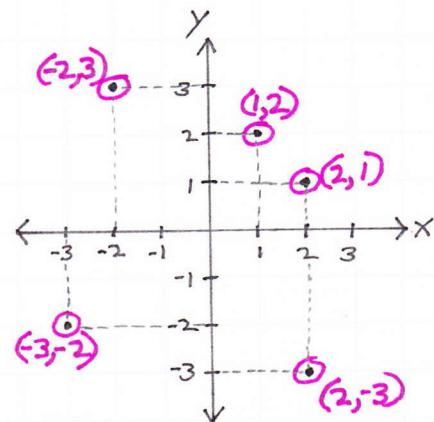
Interval Notation — A shorthand way of writing the domain or range of a function, or intervals over which the function is increasing, decreasing, or constant.

Use:

"(" or ")" if the endpoint **is not** included ("less/greater than")

Note: That means you will always use these with ±∞, because infinity is not an actual number that can be an endpoint. It's the concept of increasing or decreasing forever.

"[" or "]" if the endpoint **is** included. ("less than or equal to" or "greater than or equal to")

Interval Notation

On the number line, you may see either the parentheses & brackets, or open & filled circles.

Examples:

$x < 7$ $(-\infty, 7)$

$x \leq 7$ $(-\infty, 7]$

$x > 7$ $(7, \infty)$
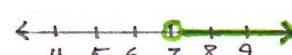
$x \geq 7$ $[7, \infty)$

$5 < x < 8$ $(5, 8)$

$5 \leq x < 8$ $[5, 8)$

$5 < x \leq 8$ $(5, 8]$

$5 \leq x \leq 8$ $[5, 8]$

Example: $y = 2x - 3$

Ordered pairs to plot:

$x = -1, \quad y = 2(-1) - 3 = -5$

$x = 0, \quad y = 2(0) - 3 = -3$

$x = +1, \quad y = 2(1) - 3 = -1$

$x = 2, \quad y = 2(2) - 3 = +1$

Ordered Pairs

$(-1, -5)$

$(0, -3)$

$(1, -1)$

$(2, 1)$
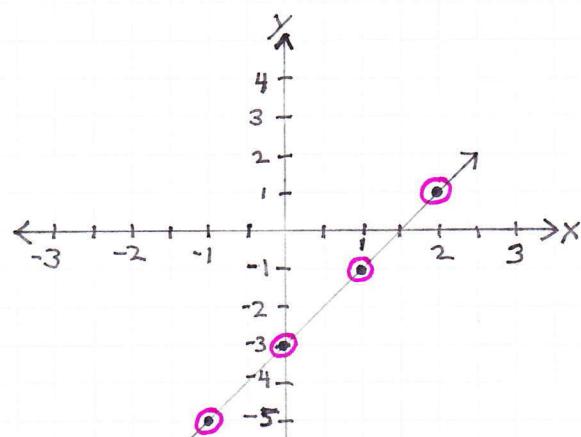
Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Interval Notation