SET NOTATION

Here is a quick summary of the correct notation used in writing number intervals.

There are basically two ways to write number intervals:
(1) Interval Notation and (2) Set Builder Notation

Set Builder Notation can be written in two ways. One uses braces { } and the other does not.

In algebra courses we usually use Interval Notation. But the shortened version of Set Builder Notation is also fine. Using brackets is **not** recommended!

Numbers	**Interval Notation**	**Set Builder**	**Set Builder with { }**
All real numbers	$(-\infty, \infty)$	All real numbers*	All real numbers*
All real numbers between -2 and 3, **including neither -2 nor 3**	$(-2, 3)$	$-2 < x < 3$	$\{x \mid -2 < x < 3\}$
All real numbers between -2 and 3, **including -2 but not including 3**	$[-2, 3)$	$-2 \leq x < 3$	$\{x \mid -2 \leq x < 3\}$
All real numbers between -2 and 3, **not including -2 but including 3**	$(-2, 3]$	$-2 < x \leq 3$	$\{x \mid -2 < x \leq 3\}$
All real numbers between -2 and 3, **including both -2 and 3**	$[-2, 3]$	$-2 \leq x \leq 3$	$\{x \mid -2 \leq x \leq 3\}$
All real numbers less than -2 but not equal to -2, **not including -2**	$(-\infty, -2)$	$x < -2$	$\{x \mid x < -2\}$
All real numbers less than -2, **including -2**	$(-\infty, -2]$	$x \leq -2$	$\{x \mid x \leq -2\}$
All real numbers greater than 3 but not equal to 3, **not including 3**	$(3, \infty)$	$x > 3$	$\{x \mid x > 3\}$
All real numbers greater than or equal to 3, **including 3**	$[3, \infty)$	$x \geq 3$	$\{x \mid x \geq 3\}$

*Note that "the set of all real numbers" can be written as a *script* upper case $\mathcal{R}$. In handwriting we usually make a double line in the left down stroke of the R to indicate this.

Also please note that, while some may argue to the contrary, the notation $-\infty < x < \infty$ is not considered standard.

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