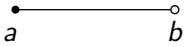
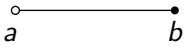
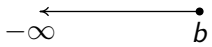
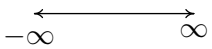
MATH 1650: SECTION A.1: INTERVAL NOTATION

Let a and b be real numbers with $a < b$.

Set of Real Numbers	Interval Notation	Region on the Real Number Line
$\{x \mid a < x < b\}$	(a, b)	
$\{x \mid a \leq x < b\}$	$[a, b)$	
$\{x \mid a < x \leq b\}$	$(a, b]$	
$\{x \mid a \leq x \leq b\}$	$[a, b]$	
$\{x \mid x < b\}$	$(-\infty, b)$	
$\{x \mid x \leq b\}$	$(-\infty, b]$	
$\{x \mid x > a\}$	(a, ∞)	
$\{x \mid x \geq a\}$	$[a, \infty)$	
$\mathbb{R}$	$(-\infty, \infty)$	

Notational Rules:

- It's always the <u>smaller</u> number (or $-\infty$) first.
- If a number is not included, we use a parenthesis: '(' or ')' ('∞' and '$-\infty$' are <u>never</u> included!).
- If the number is included, we use a bracket: '[' or ']'.

EXAMPLE:

Set of Real Numbers	Interval Notation	Region on the Real Number Line
		
$\{x \mid -1 \leq x \leq 4\}$		
	$(-\infty, 5]$	
$\{x \mid x > -2\}$		

RECALL: The 'union' symbol, '$\cup$' is how to mathematically represent sets described using the conjunction 'or'.
EXAMPLE: Express the following sets using interval notation. Use '$\cup$' as needed.

1. $\{x \mid x \leq -2 \text{ or } x \geq 2\}$

2. $\{x \mid x \neq 3\}$

3. $\{x \mid x \neq \pm 3\}$

4. $\{x \mid -1 < x \leq 3 \text{ or } x = 5\}$

ADDITIONAL REVIEW: Section A.1: 4, 11 - 22