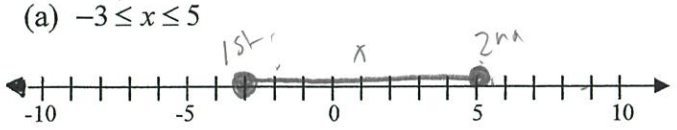
Name: Key Date: _____

INTERVAL NOTATION
COMMON CORE ALGEBRA I

We will often want to talk about **continuous segments** of the **real number line.** We've already done work with this in the last lesson using what is known as **inequality or set-builder notation**. Today we will see a very simple way of showing these segments.

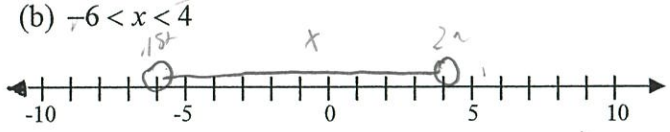
***Exercise* #1:** For each of the following, graph the portion of the number line described by the inequality and then write the equivalent using **interval notation**. [ ]

(a) $-3 \le x \le 5$



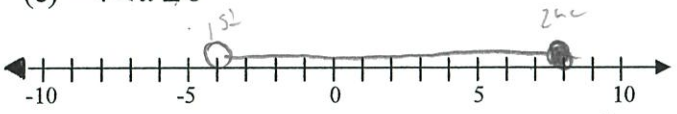
Equivalent Interval Notation: [-3, 5]

(b) $-6 < x < 4$



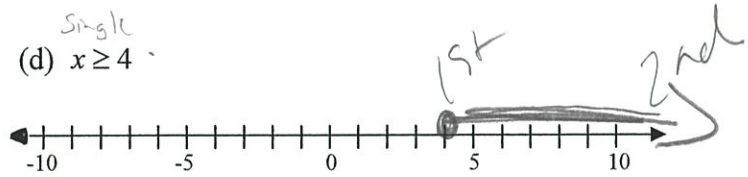
Equivalent Interval Notation: (-6, 4)

(c) $-4 < x \le 8$



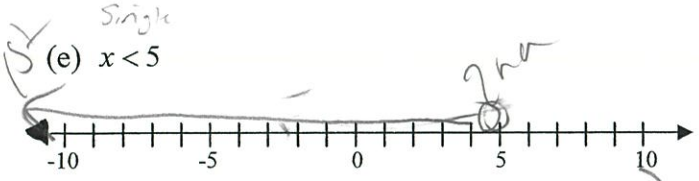
Equivalent Interval Notation: (-4, 8]

(d) $x \ge 4$



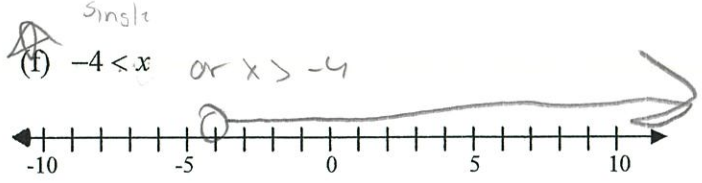
Equivalent Interval Notation: [4, ∞)

(e) $x < 5$



Equivalent Interval Notation: (-∞, 5)

(f) $-4 < x$



Equivalent Interval Notation: (-4, ∞)

One of the great advantages of **interval notation** is that we essentially need to know a starting value, an ending value and then whether they are included or not.

***Exercise* #2:** Which of the following represents the equivalent interval to $-12 \le x < 4$? [ )

(1) $(-12, 4)$

(2) $(-12, 4]$

(3) $[-12, 4)$

(4) $[-12, 4]$

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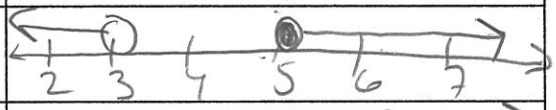
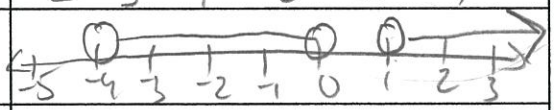
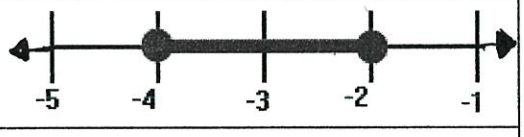
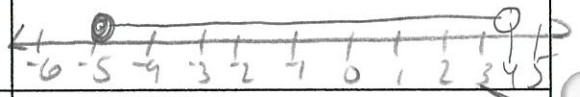
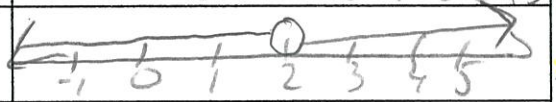
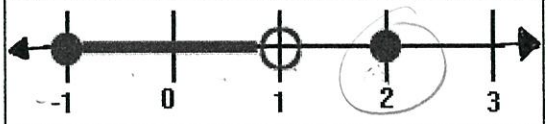
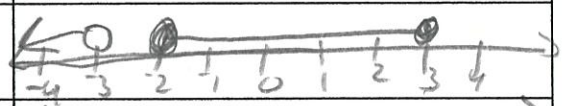
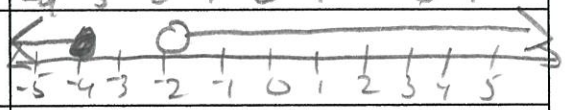
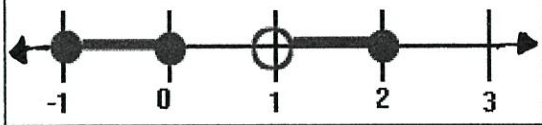
$\in$ = element

$\mathbb{R}$ = reals

Review of Set Theory

	Set-builder Notation	Interval Notation	Graph
1.	$\{x \in \mathbb{R} \mid x < 3 \text{ or } x \geq 5\}$	$(-\infty, 3) \cup [5, \infty)$	
2.	$\{x \in \mathbb{R} \mid -4 < x < 0 \text{ OR } x > 1\}$	$(-4, 0) \cup (1, \infty)$	
3.	$\{x \in \mathbb{R} \mid -4 \leq x \leq -2\}$	$[-4, -2]$	
4.	$\{x \in \mathbb{R} \mid -5 \leq x < 4\}$	$[-5, 4)$	
5.	$\{x \in \mathbb{R} \mid x < 2 \text{ OR } x > 2\}$	$(-\infty, 2) \cup (2, \infty)$	
6.	$\{x \in \mathbb{R} \mid -1 \leq x < 1 \text{ OR } x = 2\}$	$[-1, 1) \cup [2]$	
7.	$\{x \in \mathbb{R} \mid x < -3 \text{ or } -2 \leq x \leq 3\}$	$(-\infty, -3) \cup [-2, 3]$	
8.	$\{x \in \mathbb{R} \mid x \leq -4 \text{ OR } x > -2\}$	$(-\infty, -4] \cup (-2, \infty)$	
9.	$\{x \in \mathbb{R} \mid -1 \leq x \leq 0 \text{ OR } 1 < x \leq 2\}$	$[-1, 0] \cup (1, 2]$	
10.	$\{x \in \mathbb{R} \mid x \leq -2 \text{ or } -1 < x < 4\}$	$(-\infty, -2] \cup (-1, 4)$