

## Algebra RH

### Essential Question: How do we graph compound inequalities?

**Do Now:** Determine whether each compound statement below is true or false.

- a) Right now, I am in math class **and** English class.      b) Right now, I am in math class **or** English class.
- c)  $5 > 1$  **and**  $5 < 7$       d)  $5 > 1$  **or**  $5 < 7$
- e)  $5 < 1$  **and**  $5 < 7$       f)  $5 < 1$  **or**  $5 < 7$

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## Compound Inequalities

A compound inequality is two or more inequalities connected by the word \_\_\_\_\_ or by the word \_\_\_\_\_.

A compound inequality containing the word **AND** is true if \_\_\_\_\_ inequalities are true. This type of inequality is called a **conjunction**.

A compound inequality containing the word **OR** is true if \_\_\_\_\_ of the inequalities are true. This type of inequality is called a **disjunction**.

## Graphing Compound Inequalities (Conjunctions and Disjunctions)

- Graph the first inequality on a number line
- Graph the second inequality on the same number line above the first inequality
- If “AND”, graph the overlap (only solutions that the two inequalities have in common)
- If “OR”, graph the combination of both inequalities

**Graph each compound inequality and represent the solution set in interval notation.**

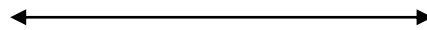
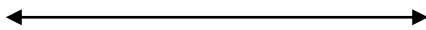
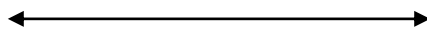
1.  $x \geq 0$  **and**  $x < 5$

2.  $x \geq 0$  **or**  $x < 5$



3.  $x < -6$  and  $x > 4$

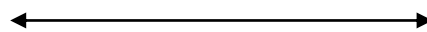
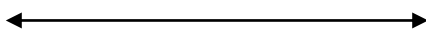
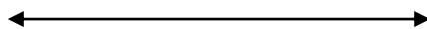
4.  $x < -6$  or  $x > 4$



The symbols  $\cap$  or  $\cup$  can be used to represent the word **OR**

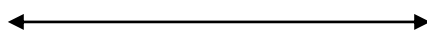
5.  $x > 0$  and  $x \geq 3$

6.  $x > 0$  or  $x \geq 3$



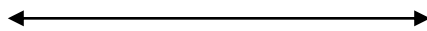
7.  $x \leq -1$  and  $x > -4$

8.  $x \leq -1$  or  $x > -4$



9.  $-2 < x \leq 2$

10.  $x > -2$  or  $x \leq 2$



**Directions:** Graph the solution set to each compound inequality on a separate sheet of paper.

**Conjunctions:**

1.  $x \geq -3$  and  $x < 2$

2.  $-4 < x < 4$

3.  $x \leq 5$  and  $x < 2$

4.  $x > -1$  and  $x > 3$

5.  $0 \geq x \geq 6$

**Disjunctions:**

6.  $x < -1$  or  $x > 4$

7.  $x > -2$  or  $x \leq 5$

8.  $x \geq 6$  or  $x \geq 10$

9.  $x > 3$  or  $x \leq -3$

10.  $x < 4$  or  $x < 7$