

# 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 <sup>T</sup> and English class. <sup>F</sup> False
- b) Right now, I am in math class <sup>T</sup> or English class. <sup>F</sup> True
- c) <sup>T</sup> <sup>T</sup>  $5 > 1$  and  $5 < 7$  True
- d) <sup>T</sup> <sup>T</sup>  $5 > 1$  or  $5 < 7$  True
- e) <sup>F</sup> <sup>T</sup>  $5 < 1$  and  $5 < 7$  False
- f) <sup>F</sup> <sup>T</sup>  $5 < 1$  or  $5 < 7$  True

## Compound Inequalities

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

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

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

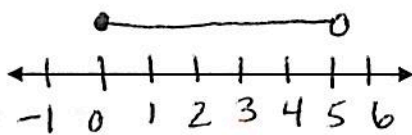
## Graphing Compound Inequalities (Conjunctions and Disjunctions)

- 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  $x < 5$

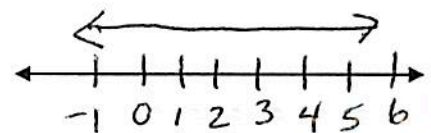
(solutions overlap)



$[0, 5)$

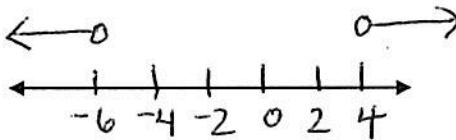
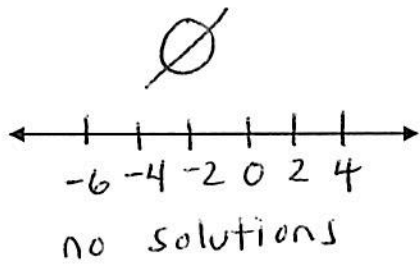
2.  $x \geq 0$  or  $x < 5$

(combine all solutions)



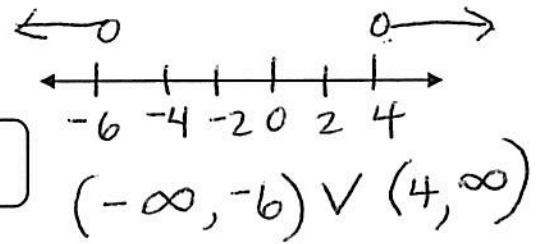
$(-\infty, \infty)$

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

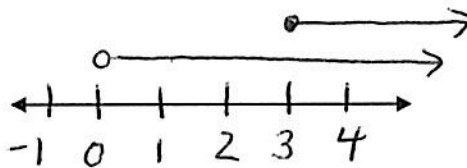
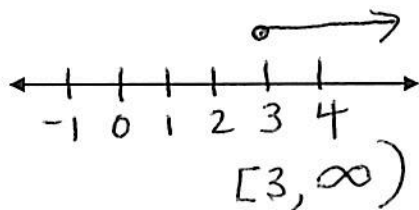


The symbols  $\cap$  or  $\cup$  can be used to represent the word OR

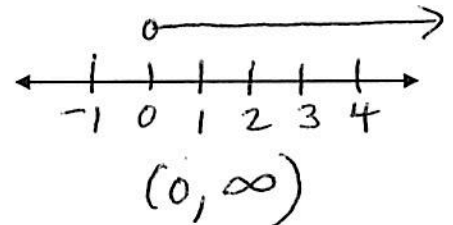
4.  $x < -6$  or  $x > 4$



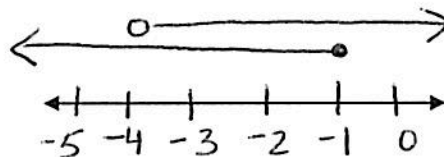
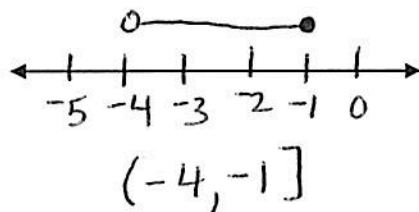
5.  $x > 0$  and  $x \geq 3$



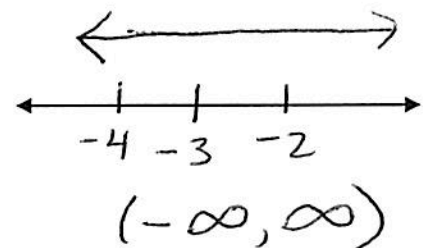
6.  $x > 0$  or  $x \geq 3$



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

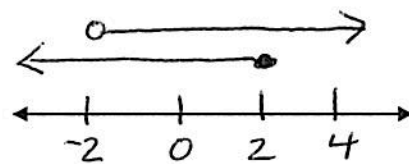
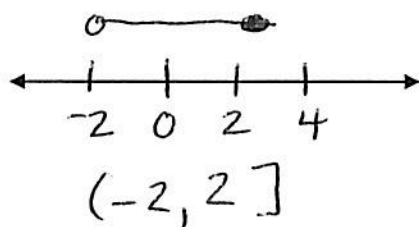


8.  $x \leq -1$  or  $x > -4$



9.  $-2 < x \leq 2$

$x > -2$  and  $x \leq 2$



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

