Name: _____   Date: _____

MORE WORK WITH COMPOUND INEQUALITIES
## COMMON CORE ALGEBRA I

Compound inequalities are used in mathematics for a variety of purposes. It's good to get more practice in them, especially when it comes to visualizing what values of *x* lie in their solution sets.

Exercise #1: Graph each of the following compound inequalities on the number lines provided. For (c) and (d) write the inequalities as a single statement.
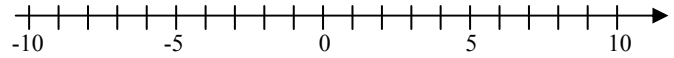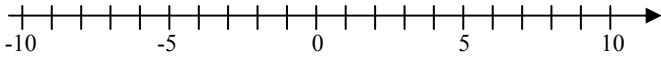
(a) $x < 1$ or $x \geq 4$

(b) $x > 7$ or $x < -2$
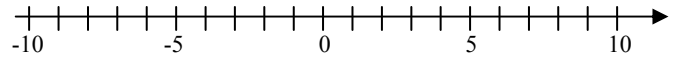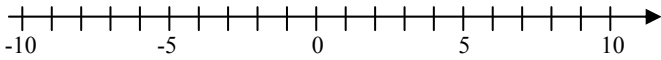
(c) $x > -3$ and $x < 5$

(d) $x \leq 9$ and $x \geq 0$

Single Inequality: _____

Single Inequality: _____

Inequalities involving AND are almost always universally written as a single inequality because these tend to show us how all values of *x* are between two numbers.
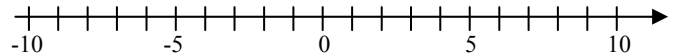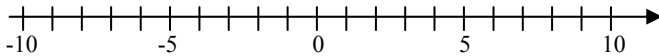
Exercise #2: Graph each of the following. First, rewrite as two inequalities involving the AND connector.

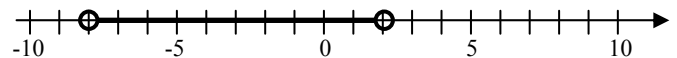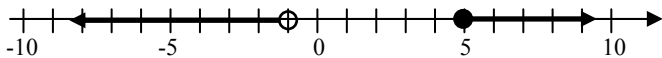(a) $-4 \leq x < 6$

(b) $-5 \leq x \leq 9$

Two Inequalities: _____

Two Inequalities: _____

Exercise #3: For each of the following graphs, write a compound inequality that describes all of the numbers shown graphed.

(a) Compound Inequality:_____

(b) Compound Inequality: _____

We now can put together our skills at solving inequalities with compound inequalities to write very sophisticated solution sets.

Exercise #4: Consider the compound inequality given by:

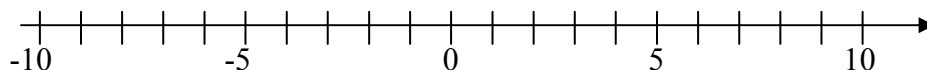$$6x+1\geq 4 \quad \text{and} \quad -2x+8 > -12$$

(a) Determine whether each of the following values of x falls in the solution set to this compound inequality. Show the work that leads to each answer.

$x = 5$ $x = -3$ $x = 10$

(b) Solve the compound inequality and graph its solution on the number line shown below.

A very curious thing happens in the next compound inequality.

Exercise #5: Consider the compound inequality shown below:

$$\frac{1}{2}(x+4) < 5 \quad \text{or} \quad -2(x-4) \leq 14$$
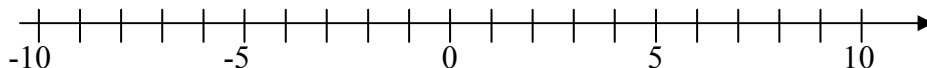
(a) Show that each of the following three values of x solve the compound inequality.

$x = -6$ $x = 0$ $x = 8$

(b) Solve this compound inequality, graph the solution on the number line. What can you say about the solution set of this inequality?
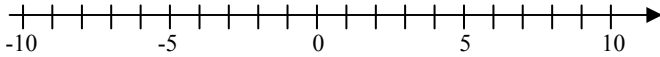
MORE WORK WITH COMPOUND INEQUALITIES
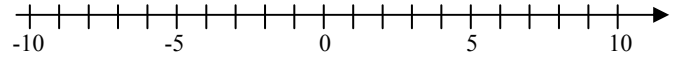### COMMON CORE ALGEBRA I HOMEWORK

FLUENCY

1. Graph each of the following compound inequalities on the number lines provided. If it's an AND statement write the inequality as a single statement.
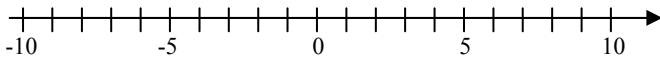
   (a) $x > 5$ or $x \leq 3$

   (b) $x \geq -7$ and $x < 10$
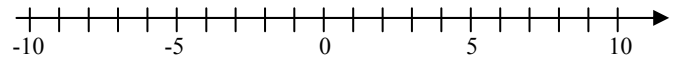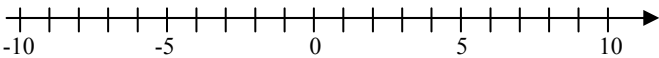

   (c) $x \leq 3$ or $x < -6$

   (d) $x < 3$ and $x > -5$

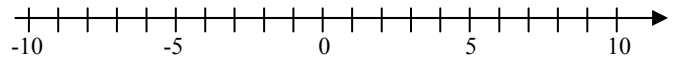2. Graph each of the following. First, rewrite as two inequalities involving the AND connector.
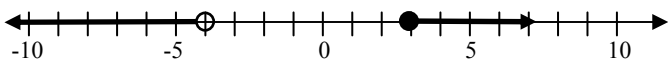
   (a) $-7 \leq x < 5$

   Two Inequalities: _____

   (b) $-2 \leq x \leq 6$

   Two Inequalities: _____

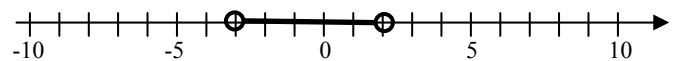

3. For each of the following graphs, write a compound inequality that describes all of the numbers shown on the graph.

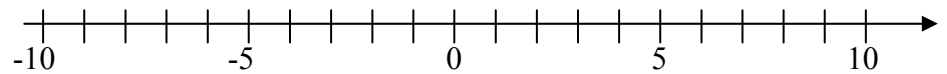   (a) Compound Inequality:_____

   (b) Compound Inequality: _____

REASONING

4. Consider the compound inequality given by:

$$-2 \le \frac{1}{2}x + 2 \text{ and } \frac{1}{2}x + 2 < 3$$

Solve this compound inequality and graph the solution on the number line. Write the solution set as a single algebraic statement.

5. Consider the compound inequality: $-7 \le 2x - 5 < 7$

(a) Using the skills you have learned today, rewrite the following inequality using the AND connector?

(b) Solve the compound inequality you found in part (a) and graph the solution on the number line. Rewrite your answer as a single statement.
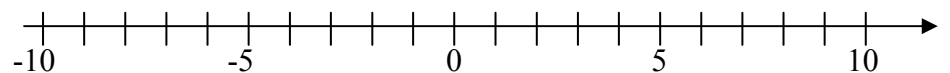
(c) Using the skills above, try and simplify the following inequality. Graph the solution on the number line and rewrite your answer as a single statement.

$$-3 \le 3x + 3 < 2x + 10$$