

Compound Inequalities and Graphing

Lesson Plan

Cube Fellow: Matthew Wells

Teacher Mentor: Kimberly Halsey

Goal: The main goal of this lesson is to connect solving compound inequalities with the geometry behind the ideas. Here, solving compound inequalities is in the context of a high school algebra II class. The words “and” and “or” will be better re-enforced by having a geometrical interpretation of the inequalities. Some secondary goals will be to get the students to problem solve without the actual calculation of a problem and to get better acquainted with lines, slopes, and intersecting points.

Grade and Course: Tenth-Eleventh grade Algebra II course

KY Standards: MA-HS-5.3.1 : Students will model, solve, and graph first degree, single variable equations and inequalities, including absolute value, based in real-world and mathematical problems and graph the solutions on a number line.

Objectives: The students will be able to:

- 1) Connect the linear functions in an algebraic inequality to lines on a Cartesian plane.
- 2) Find solution sets for algebraic inequalities.
- 3) Determine pictorially what the solution set is referring to when observing the lines and the Cartesian plane.
- 4) Distinguish between “and” and “or” when used in logical sentences
- 5) Give the students a graphical representation of inequalities

Resources/materials needed: Pre-planned worksheet for entire class(attached to this lesson plan), colored pencils

Description of Plan: At the beginning of the lesson, the instructor will give each student a copy of the worksheet (attached to this lesson outline) and three different colored pencils. Everyone starts on the first page, in which there are Cartesian planes with lightly written lines, and questions concerning the different lines in the pictures. The instructor will then go through each problem. At the beginning of a problem, the instructor will dictate which line is LINE 1, LINE 2, and LINE 3. The students will then color their lines in accordingly, being sure to have some sort of color key to follow. The instructor should also draw the diagram with colors on the board for all to see and follow. Then the instructor will ask where lines are greater or less than other lines. Having a student volunteer show the class is recommended

while doing this. Without giving an explicit solution set, the students will shade the part of the x-axis which represents the solution set. This again re-enforces the ideas of “and” and “or”. Once the students have completed the first page (front and back), the class will proceed onto the second page. Note that the pictures on the second page are exactly like that of the first page. Thus have the students color the exact same lines like they did on the first page. After that, go through the problems again, except now give them equations for each of the lines. Show them how they can solve each inequality, and then have them find solution sets for the rest of the problems. At the end, the students should be able to connect solving algebraic inequalities to that of finding where lines are different than other lines.

Lesson Source: Cube Fellow

Instructional Mode: Integrated lecture and discussion (non-group collaboration)

Date Given: October 5, 2006 **Estimated Time:** One 45-minute class period

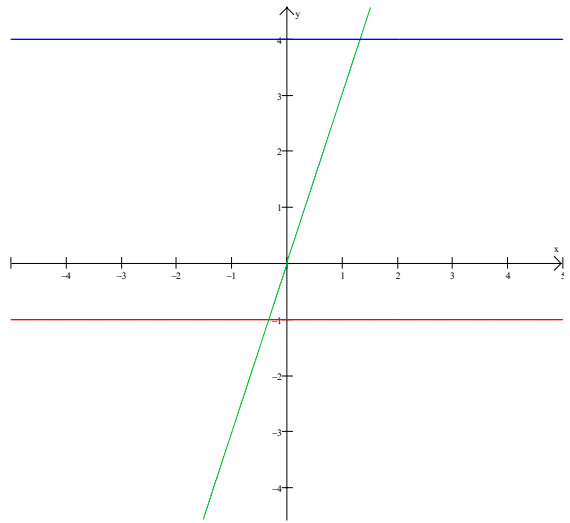
Date Submitted to Algebra³: November 27, 2006

Algebra II—CB

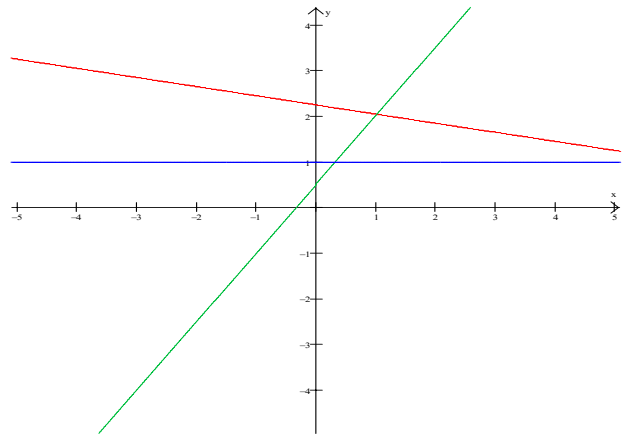
Compound Inequalities Activity

Name _____
Date _____

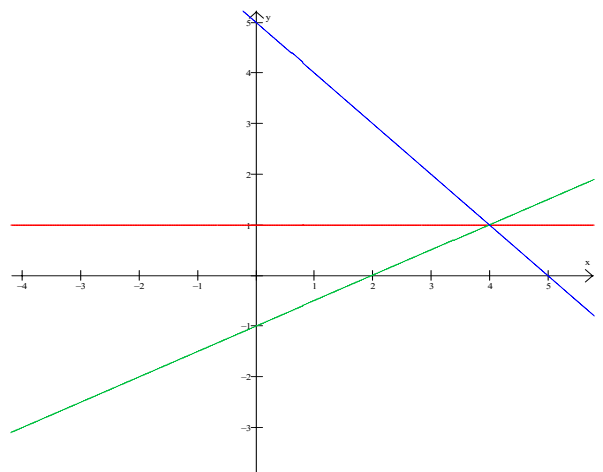
- 1.) Shade the part of **LINE 2** that is greater than **LINE 1**.
Shade the part of **LINE 2** that is less than **LINE 3**.
Where is **LINE 2** greater than **LINE 1** and less than **LINE 3**?



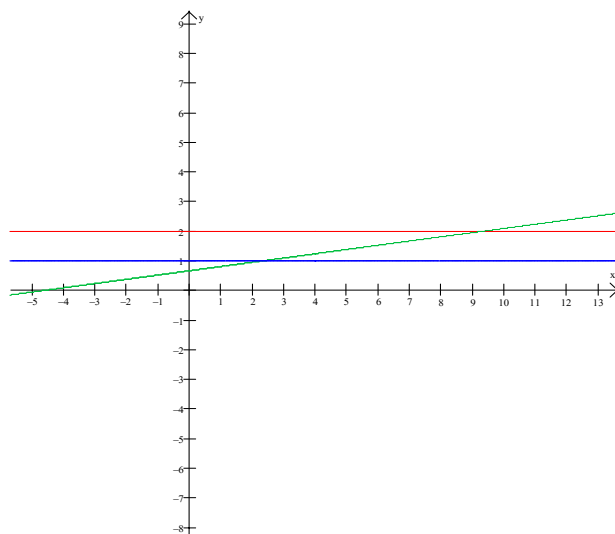
- 2.) Shade the part of **LINE 2** that is greater than **LINE 1**.
Shade the part of **LINE 2** that is less than **LINE 3**.
Where is **LINE 2** greater than **LINE 1** and less than **LINE 3**?



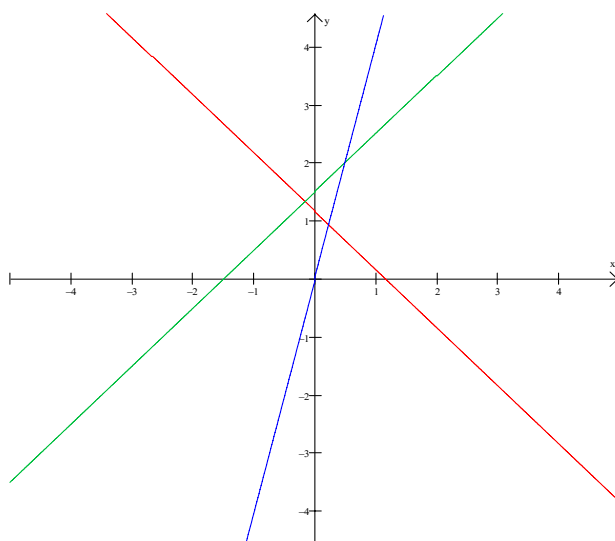
- 3.) Shade the part of **LINE 2** that is greater than or equal to **LINE 1**.
Shade the part of **LINE 2** that is less than or equal to **LINE 3**.
Where is **LINE 2** greater than or equal to **LINE 1** and less than or equal to **LINE 3**?



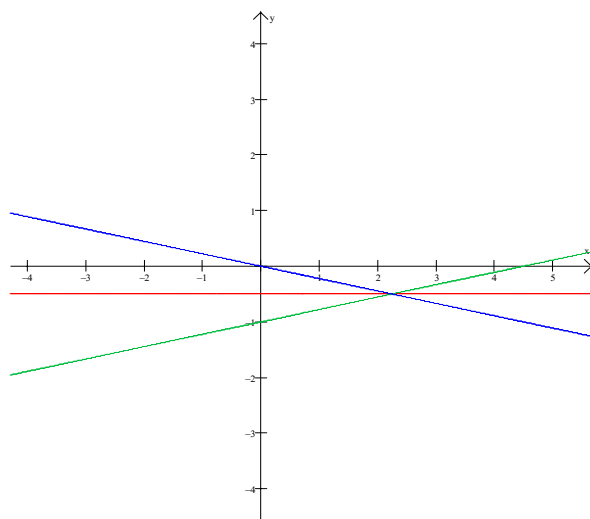
- 4.) Shade the part of **LINE 2** that is greater than **LINE 1**.
 Shade the part of **LINE 2** that is less than **LINE 3**.
 Where is **LINE 2** greater than **LINE 1** or less than **LINE 3**?



- 5.) Shade the part of **LINE 2** that is greater than **LINE 1**.
 Shade the part of **LINE 2** that is less than **LINE 3**.
 Where is **LINE 2** greater than **LINE 1** or less than **LINE 3**?



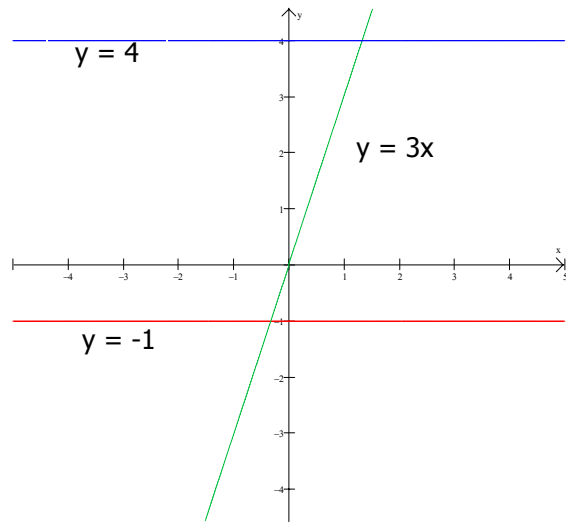
- 6.) Shade the part of **LINE 2** that is greater than or equal to **LINE 1**.
 Shade the part of **LINE 2** that is less than or equal to **LINE 3**.
 Where is **LINE 2** greater than or equal to **LINE 1** or less than or equal to **LINE 3**?



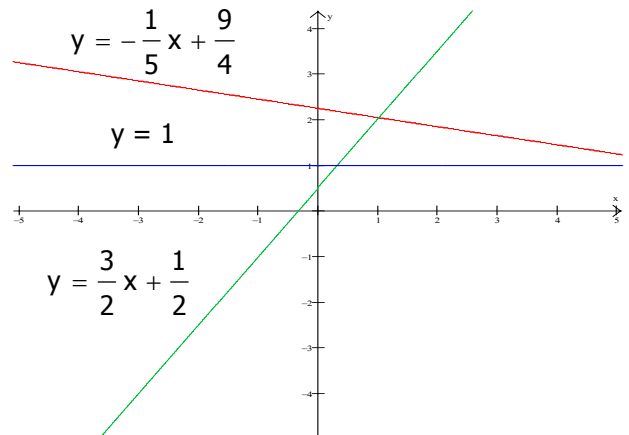
Algebra II—CB
Compound Inequalities Activity
Part 2

Name _____
 Date _____

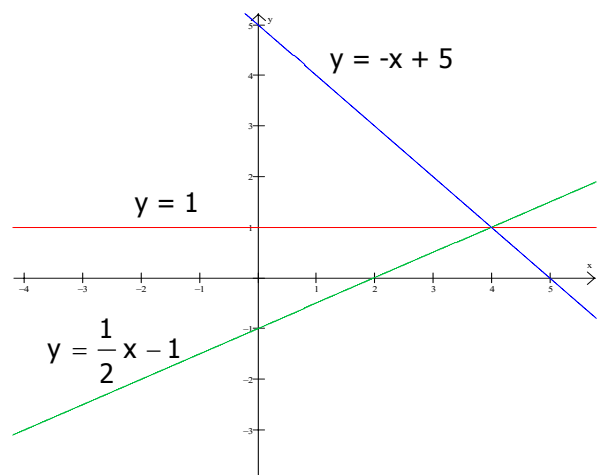
1.) **LINE 1** < **LINE 2** *AND* **LINE 2** < **LINE 3**



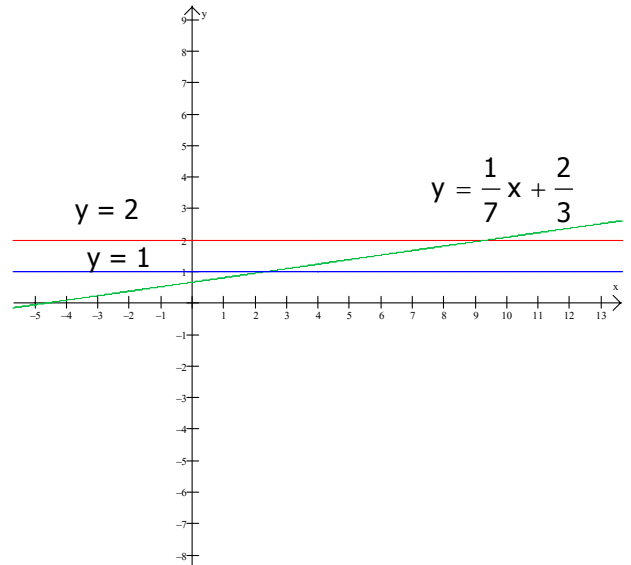
2.) **LINE 1** < **LINE 2** *AND* **LINE 2** < **LINE 3**



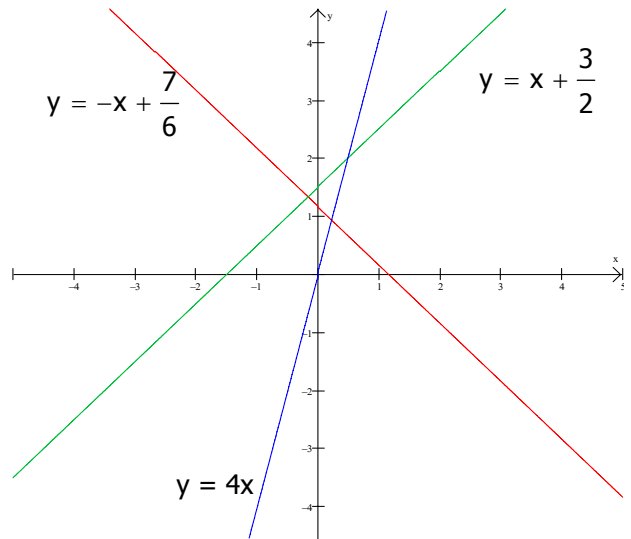
3.) **LINE 1** \leq **LINE 2** *AND* **LINE 2** \leq **LINE 3**



4.) LINE 1 < LINE 2 OR LINE 2 < LINE 3



5.) LINE 1 < LINE 2 OR LINE 2 < LINE 3



6.) LINE 1 \leq LINE 2 OR LINE 2 \leq LINE 3

