61 Cooperative Learning Activities in Algebra 1

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Contents

16. Inequalities

Teacher Guide Page

Learning Outcome: The student will display an ability to form the solution sets for basic linear inequalities.

NCTM Standards Addressed:

3. Reasoning
5. Algebra
14. Mathematical structure

Time: 45 minutes

Assessment Opportunities: Teacher observation, peer feedback, student work

Materials: A copy of one problem on Reproducible 16 for each team

Team Size: 3–4, selected randomly (six teams maximum)

Background: This activity utilizes *constructivist learning theory*. Students will explore a mathematical concept. They become mathematically literate in that concept and then edit their original work to reinforce their growth in the concept.

Present this activity when students have the mathematical literacy for **replacement set**, solving **linear equations**, and the structure of **whole numbers**, **integers**, and **rational numbers**.

Procedure

Copy Reproducible 16 and cut out one problem for each team. Form teams. Distribute the examples randomly.

Directions for students: *Solve the inequalities for each given replacement set:*
Whole numbers
Integers
Rational numbers

Inform students that each of them will be responsible for a paper at the end of the class.

Each team should present to the class its method of solving the problem. The presentation should be done with the entire team at the front of the classroom.

Your assessment of the accuracy and methodologies is critical. You may decide to respond to each team's presentation, or to wait until all presentations have been completed so as not to intimidate the students on teams that present later.

After all teams have presented, you have two options: (1) You may opt to instruct traditionally, using an appropriate method for solving linear inequalities; *or* (2) you may synthesize student responses to achieve the same result implied in the first option.

Give students the opportunity to edit their original responses for their examples. Ask each student to pass in his or her responses to the team problem.

Reproducible 16

Inequalities

Give one of the following to each team:

Team #: _____

Show the solution for the following replacement sets:

Whole Numbers, Integers, Rational Numbers

$-3x + 8 > -3$

Team #: _____

Show the solution for the following replacement sets:

Whole Numbers, Integers, Rational Numbers

$2x - 5 > -11$

Team #: _____

Show the solution for the following replacement sets:

Whole Numbers, Integers, Rational Numbers

$2 - x > 4$

Team #: _____

Show the solution for the following replacement sets:

Whole Numbers, Integers, Rational Numbers

$3 - x < 7$

Team #: _____

Show the solution for the following replacement sets:

Whole Numbers, Integers, Rational Numbers

$3x - 4 > 5$

Team #: _____

Show the solution for the following replacement sets:

Whole Numbers, Integers, Rational Numbers

$2x + 3 > 5$

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26. Graphing on a Cartesian Coordinate System

Teacher Guide Page

Learning Outcome: The student will show an understanding of plotting points on a Cartesian coordinate system.

NCTM Standards Addressed:

5. Algebra
7. Geometry from a synthetic perspective
8. Geometry from an algebraic perspective
14. Mathematical structure

Time: 45 minutes

Assessment Opportunities: Teacher observation, student reflection

Materials: Graph paper, copy of Forms 1 and 2 for each team

Team Size: 4 per team ideal, fewer members if class size requires, with gofer for each team

Background: This activity reviews the skills that students developed prior to an Algebra I course. It is an introductory activity for graphing skills.

Procedure

Part 1

Form teams. Select gofer.

Have each team member select a number, 1 through 4. (Omit 4 for the smaller teams.)

Gofer obtains Form 1.

Encourage team members to review with each other how to plot and read points from a Cartesian coordinate system.

Part 2

Encourage students to keep the team graph private—this activity is competitive.

Form new teams:

Student #1 stays in current seat.
Student #2 moves to the team that is one team clockwise from original location.
Student #3 moves to the team that is two teams clockwise from original location.
Student #4 moves to the team that is three teams clockwise from original location.

Distribute Form 2. Review directions. Begin competition.

(Winners may receive extra-credit points, or whatever reward may be applicable to the classroom environment.)

Name _____

Date _____

Reproducible 26

Graphing on a Cartesian Coordinate System

Form 1

Cut out each of the following and distribute to the student who has chosen the associated number. There is a competition to follow. You can ask for assistance from your teammates, but do not share your polygon with other members of the class.

Student #1: On a graph, draw a rectangle (that is not a square), such that each vertex is in a different quadrant.	***Student #2:*** On a graph, draw a square such that each vertex is in a different quadrant.
Student #3: On a graph, draw a parallelogram (that is not a square) such that each vertex is in a different quadrant.	***Student #4:*** On a graph, draw a trapezoid (that is not a square) such that each vertex is in a different quadrant.

Form 2

Rules for competition:

1. Student #1 begins.
2. Rotating clockwise, each (new) team member guesses an ordered pair.
3. Student #1 responds by identifying the position of the point guesses as:
   A vertex of the quadrilateral
   On a side of the quadrilateral
   Inside or outside the quadrilateral
4. After each point is guessed, each member, beginning with the guesser, is allowed to guess all four ordered pairs that represent the vertices of the quadrilateral. Students may pass.
5. The first student to identify correctly the ordered pairs for each of the vertices of the quadrilateral wins.
6. After student #1, student #2 takes a turn, using the same format.