

Systems of Equations

Introduction

In this activity, students will write systems of equations that are given in standard form into slope-intercept form to solve the system using tables and graphs.

Grades 9-12

NCTM Algebra Standards

- Represent and analyze mathematical situations and structures using algebraic symbols
- Write equivalent forms of equations, inequalities, and systems of equations and solve them with fluency — mentally or with paper and pencil in simple cases, and using technology in all cases

Files/Materials Needed

linearsys.act

1

- Launch TI-Navigator™ on the computer and start the session.
- Have each student log into NavNet on their calculator.

2

- Load the activity settings file *linearsys.act*.
- From below, enter the first system of equations in slope-intercept form into the Y= box and click Add after each equation. Two lines should appear on the graph in Activity Center.

$$\begin{array}{ll} 5x + 5y = 0 & 2x + 2y = -4 \\ x - 2y = 30 & 5x + 2y = 11 \\ \text{(solution: (10, -10))} & \text{(solution: (5, -7))} \end{array}$$

$$\begin{array}{ll} -3x + y = -15 & -3x + 2y = 19 \\ -5x + 5y = -5 & 4x + 3y = 20 \\ \text{(solution: (7, 6))} & \text{(solution: (-1, 8))} \end{array}$$

$$\begin{array}{l} 3x + y = 20 \\ 4x + 4y = 32 \\ \text{(solution: (6, 2))} \end{array}$$

- Highlight the equations and go to **View** and select **Mask Teacher Input** to hide the equations.
- Start the activity. Instruct students to write each equation from the first system in slope-intercept form and enter the first equation in Y1 and the second one in Y2.

- Instruct students to press **SEND** when ready to submit their graphs. If they wrote the equations in slope-intercept form correctly, their graphs will be on top of your graphs.
- To demonstrate how to solve equations graphically, use your cursor to point to the intersection of the two lines and discuss what the corresponding x- and y-values are for the point of intersection.
- To demonstrate how to solve a system of equations numerically, click on the **Equation-Graph** tab in the Activity Center and select Y1 in the first column and Y2 in the second column. Scroll until the expressions have the same x and y.
- If there are submissions that have common errors, you may pause the activity, and discuss “what a student who submitted these equations might have been thinking.”

3

- Have students log out of NavNet and use their calculators to enter the equations into Y1 and Y2 and use the table and graph functions to find the solution.
- Use **Screen Capture** to check students' understanding.

4

- Have students log back into NavNet.
- Use **Quick Poll** (with *Open Response*). For each system in step 2b, have students submit the solution.