



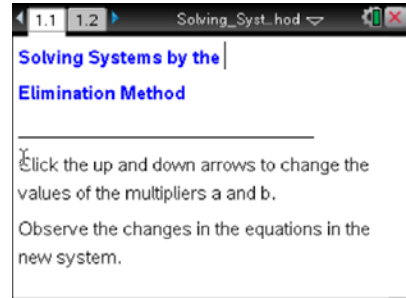
# Solving Systems by the Elimination Method

## Student Activity

Name \_\_\_\_\_  
Class \_\_\_\_\_

- Open the TI-Nspire document  
*Solving\_Systems\_by\_the\_Elimination\_Method.tns.*

This activity shows you how to create an equivalent system of equations from a given system of equations. A carefully created equivalent system of equations simplifies the solution process. Click on the  $\Delta$  or  $\nabla$  symbol on the screen to change the values of the multipliers  $a$  and  $b$ .



### Move to page 1.2.

Press **ctrl** and **ctrl** to navigate through the lesson.

1. Use the up or down symbols on the screen ( $\Delta$  or  $\nabla$ ) to change the values of  $a$  and  $b$ . How do the values of  $a$  and  $b$  determine the new system?
2. How is the equation in the box related to the equations above it?
3. Change the multipliers  $a$  and  $b$  until the coefficient of  $x$  in the boxed equation is zero. Record your multipliers:  $a = \underline{\hspace{2cm}}$ ,  $b = \underline{\hspace{2cm}}$ 
  - a. What must be true about the coefficients of  $x$  in the *new* system for their sum to be zero?
  - b. How are the new coefficients related to the coefficients in the *original* system?
  - c. Use the boxed equation to solve for  $y$ , and record your answer.
  - d. What is the solution to the system of equations? How do you know?



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4. Change the multipliers  $a$  and  $b$  to find different values that still produce a zero coefficient of  $x$  in the boxed equation. Record your multipliers:  $a = \underline{\hspace{2cm}}$ ,  $b = \underline{\hspace{2cm}}$
- a. How are the *new* coefficients related to the coefficients in the *original* system?
- b. Use the new boxed equation to solve for  $y$ , and record your answer. What do you observe about this solution compared to the one you found in problem 3c?
5. Now change the multipliers  $a$  and  $b$  until the coefficient of  $y$  in the boxed equation is zero.
- a. What do you observe about the coefficients of  $y$  in the *new* system?
- b. Use the boxed equation to solve for  $x$ , and record your answer.
- c. What is the solution to the system of equations, and how do you know?
- d. How does this compare to your solutions in Problems 3 and 4? Explain why.
6. Is it possible to eliminate one variable by producing a coefficient of zero for  $x$  in any system of equations? Justify your answer.



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Based on what you have learned, complete the following problems with pencil and paper.

7. Sarah was solving the system:
- $$\begin{aligned} -x + 4y &= 8 \\ 3x + 2y &= 18 \end{aligned}$$

She found  $x = 4$ . What should she do next, if anything?

8. Given the system:
- $$\begin{aligned} 3x + y &= 7 \\ 5x - 2y &= 8 \end{aligned}$$

- Show how you would eliminate  $x$ .
- Show how you would eliminate  $y$ .
- What is the solution to the system?