Name______________________ **Activity 3.1 – Solving Linear Systems Using Tables**

An example of a *system of linear equations* in two variables x and y is the following:

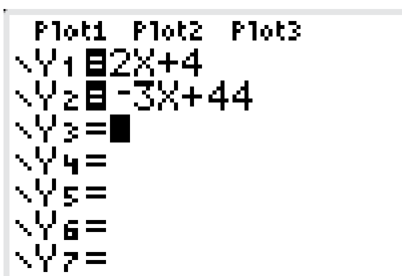
$y = 2x + 4$ Equation 1
$y = -3x + 44$ Equation 2

A *solution* of a system of equations in two variables is an ordered pair (x, y) that is a solution of both equations. One way to solve a system is to use the *table* feature of a graphing calculator.

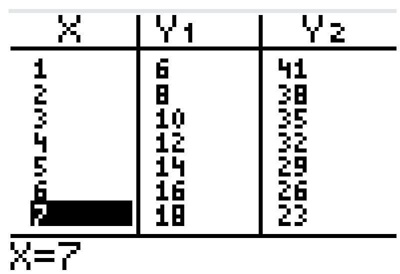
EXPLORE Solve a system

Use a table to solve the system of equations above.

STEP 1 Enter equations
Press **Y =** to enter the equations. Enter Equation 1 as y_1, and Equation 2 as y_2.

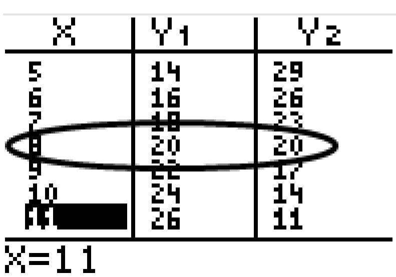


STEP 2 Make a table
Set the starting x-value of the table to 0 and the step value to 1. Then use the *table* feature to make a table.

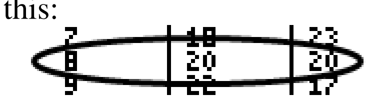


STEP 3 Find the solution

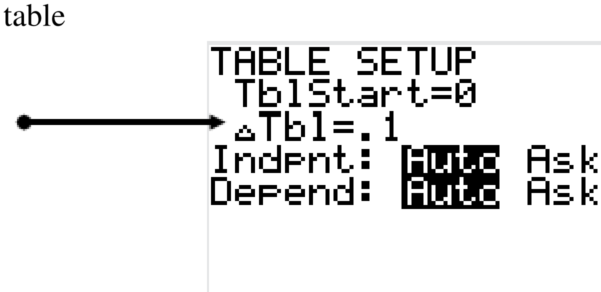
Scroll through the table until you find an x-value for which y_1 and y_2, are equal. Use this x-value and y-value to write an ordered pair. This is the solution of the system. The solution of the system is (8, 20).



Solve each system of equations. For each system that has a single solution, show a table with the solution, a table row above it, and a table row below it like this:



If you cannot find a solution, you may need to change your table settings to tenths, or even hundredths. Change your table increment, by pressing 2nd, TBLSET, like this:



If you still cannot find a solution, explain why not.

Solve each system. Show a table for systems that have a solution(s) or an explanation for systems that do not have a solution.

1) $y = -3x + 4$
$y = 8x + 4$

2) $y = -6x - 11$
$y = -3x - 5$

3) $y = -3x - 4$
$y = -5x - 10$

4) $y = 4x - 29$
$y = -2x + 19$

5) $y = -8x - 14$
$y = 9x + 3$

6) $y = 4x + 12$
$y = -4x - 28$

7. $y = 2x + 5$
$y = -x + 2$

8. $y = 4x + 1$
$y = 4x - 8$

9. $y = 4x - 3$
$y = x + 1$

10. $y = 2x - 3$
$y = x + 1$

11. $8x - 4y = 16$
$-6x + 3y = 3$

12. $6x - 2y = -2$
$-3x - 7y = 17$

13. $x + y = 11$
$-x - y = -11$

14. $-2x + y = 5$
$y = -x + 2$

15. $5x + 5y = 5$
$5x + 3y = 4.2$

Answer the following:

1. Why is it not possible for a linear system of equations to have exactly two solutions?
2. Why does the system in Exercise 13 have an infinite number of solutions?
3. If a system of linear equations in two variables has no solution, how would you describe the graphs of the equations in the system? *Explain*.
4. Describe the possible graphs of a system of linear equations in two variables. Relate the graphs to the possible number of solutions of such a system.