

## 3.1 Solving Linear Systems Using Tables

TEKS a.5, a.6,  
2A.3.B, 2A.3.C

**MATERIALS** • graphing calculator

**QUESTION** How can you solve a system of linear equations using a table?

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

$$y = 2x + 4 \quad \text{Equation 1}$$

$$y = -3x + 44 \quad \text{Equation 2}$$

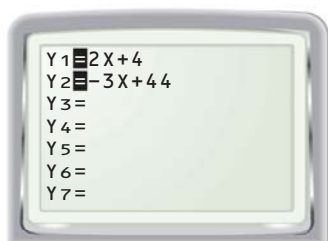
A solution of a system of equations in two variables is an ordered pair  $(x, y)$  that is a solution of both equations. One way to solve a system is to use the *table* feature of a graphing calculator.

**EXPLORE** Solve a system

Use a table to solve the system of equations above.

**STEP 1** Enter equations

Press  $\text{Y=}$  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.

X	Y1	Y2
0	4	44
1	6	41
2	8	38
3	10	35
4	12	32

X=0

**STEP 3** Find the solution

Scroll through the table until you find an  $x$ -value for which  $y_1$  and  $y_2$  are equal. The table shows  $y_1 = y_2 = 20$  when  $x = 8$ .

X	Y1	Y2
4	12	32
5	14	29
6	16	26
7	18	23
8	20	20

X=8

► The solution of the system is  $(8, 20)$ .

**DRAW CONCLUSIONS** Use your observations to complete these exercises

Use a table to solve the system. If you are using a graphing calculator, you may need to first solve the equations in the system for  $y$  before entering them.

- $y = 2x + 5$   
 $y = -x + 2$
- $y = 4x + 1$   
 $y = 4x - 8$
- $y = 4x - 3$   
 $y = \frac{3}{2}x + 2$
- $8x - 4y = 16$   
 $-6x + 3y = 3$
- $6x - 2y = -2$   
 $-3x - 7y = 17$
- $x + y = 11$   
 $-x - y = -11$
- Based on your results in Exercises 1–6, make a conjecture about the number of solutions a system of linear equations can have.