See TI-Nspire™ Handbook on pages 415–422.

6-7 Technology: Graph Systems of Equations

Objective To use a handheld to graph a system of linear equations

Two numbers have a sum of 14 and a difference of 4. What are the numbers?

Write a system of equations to represent the situation. Let x and y represent the numbers.

$$\begin{cases} x + y = 14 \\ x - y = 4 \end{cases}$$

Solve each equation for y.

$x + y = 14$

$y = -x + 14$ ← Use the Subtraction Property of Equality

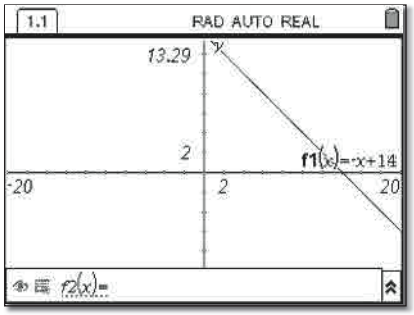
$x - y = 4$

$y = x - 4$ ← Use the Subtraction and Division Properties of Equality

► You can use a handheld to graph and solve a system of linear equations.

Step 1 Press (home). Then choose 2 to select **Graphs & Geometry**.

Step 2 Input $-x + 14$, then press (enter).



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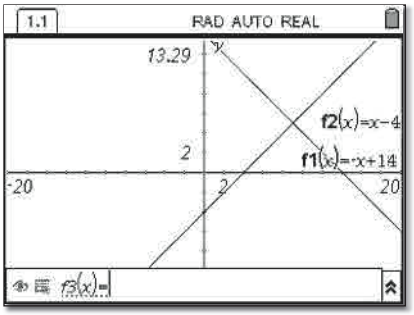
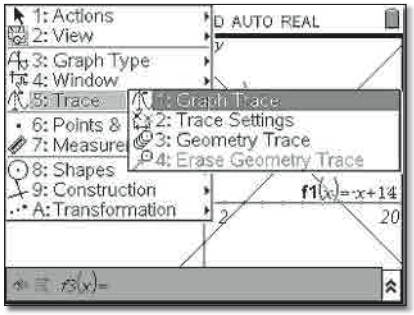
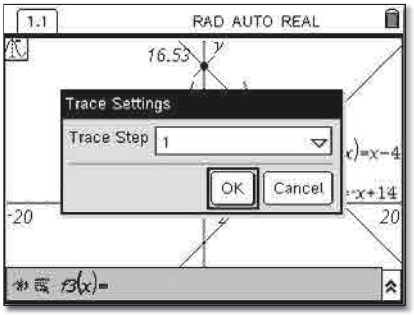
Step 3 Input $x - 4$, then press (enter).



Step 4 Press (menu). Select **Trace**, then choose **Graph Trace**.

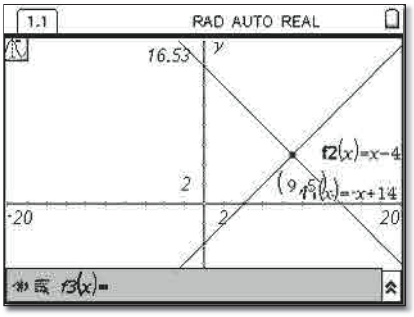


Step 5 Press (menu). Select **Trace**, then choose **Trace Settings**. Change **Trace Step** to 1.



Step 6 Press (right) to move the trace along the line to the intersection of the two linear equations.

The lines intersect at (9, 5).
So the two numbers are 9 and 5.



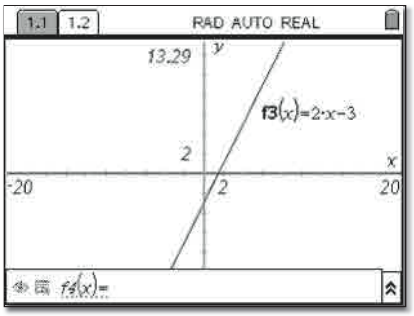
* Window setting adjusted to fit graph

Example

1 Use a handheld to solve the system of linear equations: $\begin{cases} y = 2x - 3 \\ y = 5x + 6 \end{cases}$

Step 1 Press (home). Then choose 2 to select **Graphs & Geometry**.

Step 2 Input $2x - 3$, then press enter to graph the first equation.



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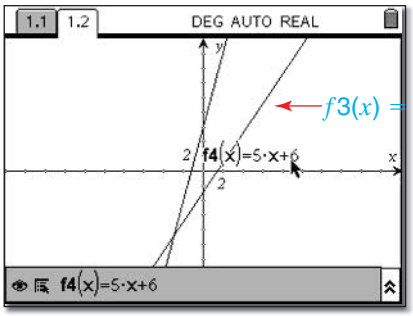
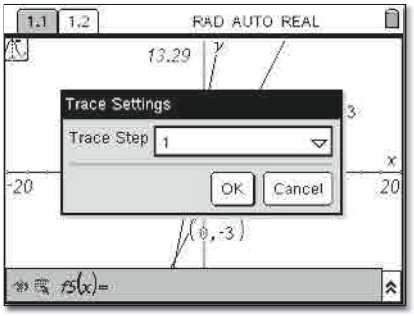
Step 3 Input $5x + 6$, then press enter to graph the linear equation.

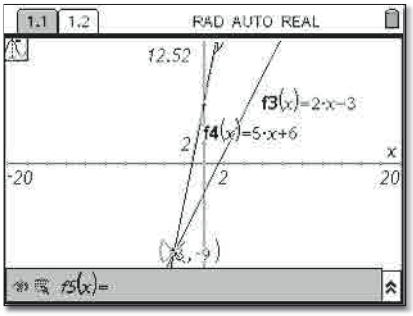


Step 4 Press menu. Select **Trace**, then press 1 to select **Graph Trace**.

Step 5 Press menu. Select **Trace**, then choose **Trace Settings**. Change **Trace Step** to 1.



Step 6 Press ◀ to move the trace along the line to the intersection of the two linear equations.



The lines intersect at $(-3, -9)$, so the solution is $(-3, -9)$.

Try These

Use a handheld to solve the system of linear equations. Check your solutions.

1. $\begin{cases} y = 3x + 4 \\ y = 5x + 8 \end{cases}$

2. $\begin{cases} y = 6 - x \\ y = 2x - 6 \end{cases}$

3. $\begin{cases} y = -2x + 7 \\ y = 3 - 6x \end{cases}$

4. $\begin{cases} x + 2y = 13 \\ 2x - 3y = -9 \end{cases}$

5. $\begin{cases} -4x + 7y = -19 \\ 5x + 4y = 11 \end{cases}$

6. $\begin{cases} 5x - 3y = 15 \\ -5x + 8y = -65 \end{cases}$

7. Discuss and Write The sum of two numbers is 0. Their difference is 16. Explain how to use a handheld to find the two numbers.

* Window setting adjusted to fit graph

Go to PRACTICE BOOK Lesson 6-7 for exercise sets.