

Solving Linear Systems by Graphing

QUESTION How can you use a graphing calculator to solve a linear system?

EXAMPLE Solve a linear system

Solve the linear system using a graphing calculator.

$$5x + 2y = 6 \quad \text{Equation 1}$$

$$x - 3y = -5 \quad \text{Equation 2}$$

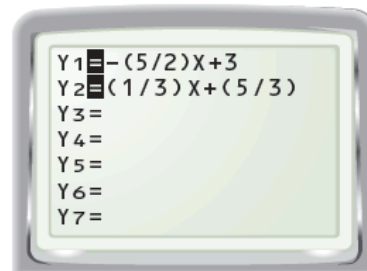
STEP 1 Rewrite equations

Solve each equation for y .

| Equation 1 | Equation 2 |
|-------------------------|----------------------------------|
| $5x + 2y = 6$ | $x - 3y = -5$ |
| $2y = -5x + 6$ | $-3y = -x - 5$ |
| $y = -\frac{5}{2}x + 3$ | $y = \frac{1}{3}x + \frac{5}{3}$ |

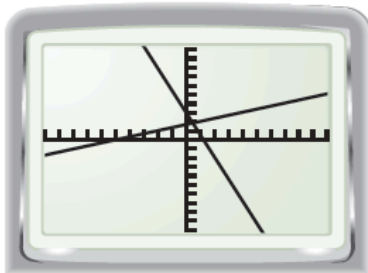
STEP 2 Enter equations

Press $\mathbf{Y=}$ and enter the equations.



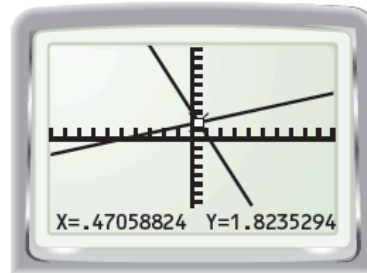
STEP 3 Display graph

Graph the equations using a standard viewing window.



STEP 4 Find point of intersection

Use the *intersect* feature to find the point where the graphs intersect.



The solution is about $(0.47, 1.8)$.

PRACTICE

Solve the linear system using a graphing calculator.

1. $y = x + 4$
 $y = -3x - 2$

2. $5x + y = -4$
 $x - y = -2$

3. $-0.45x - y = 1.35$
 $-1.8x + y = -1.8$

4. $-0.4x + 0.8y = -16$
 $1.2x + 0.4y = 1$