

## Solving Systems of Linear Equations on the Calculator

1. Solve the system:  $y = -2x + 9$  and  $y = 3x - 4$

1. Enter the first equation into  $Y_1$ .
2. Enter the second equation into  $Y_2$ .
3. Hit **GRAPH.** *not necessary*
4. Use the **INTERSECT** option to find where the two graphs intersect (the answer).  
 2nd **TRACE (CALC)** #5 **intersect**  
 Move spider close to the intersection.  
 Hit **ENTER** 3 times.
5. Answer:  $x = 2.6$  and  $y = 3.8$  (2.6, 3.8)

Plot1	Plot2	Plot3
$Y_1 = -2X + 9$		
$Y_2 = 3X - 4$		
$Y_3 =$		
$Y_4 =$		
$Y_5 =$		
$Y_6 =$		
$Y_7 =$		

Solve each system of equations. Round all answers to the nearest tenth.

1. 
$$\begin{cases} y = -\frac{1}{4}x + 3 \\ y = -\frac{1}{2}x + 6 \end{cases}$$
*check*  
 $0 = -\frac{1}{4}(12) + 3$   
 $0 = -3 + 3 \checkmark$   
 $0 = -\frac{1}{2}(12) + 6$   
 $0 = -6 + 6 \checkmark$   
 Solution:  $(12, 0)$

2. 
$$\begin{cases} y = -\frac{2}{3}x - 1 \\ y = \frac{1}{2}x - 1 \end{cases}$$
  
 Solution:  $(0, -1)$

3. 
$$\begin{cases} y = x - 5 \\ y = -x - 3 \end{cases}$$
  
 Solution:  $(1, -4)$

4. 
$$\begin{cases} y = x - 7 \\ y = 2x + 3 \end{cases}$$
  
 Solution:  $(-10, -17)$

5. 
$$\begin{cases} y = x + 8 \\ y = x - 3 \end{cases}$$
  
 Solution: *No solution*  
*Parallel lines*

6. 
$$\begin{cases} y = -3 \\ y = 3 \end{cases}$$
   
 Solution: *No solution*  
*Parallel lines*

Must be in Slope-Intercept Form  $y = mx + b$

2. Solve the system:  $x - 2y = 14$  and  $x + 3y = 9$

The graphing calculator will only accept entries that start with  $y =$ , so we need to solve these equations for  $y =$ .

$$y = \frac{x}{2} - 7$$

$$y = -\frac{x}{3} + 3$$

1. Enter the first equation into  $Y_1$ .
2. Enter the second equation into  $Y_2$ .
3. Hit **GRAPH**. The graphs appear to intersect OFF the window. We need MORE  $x$ -values to the right hand side of the graph. Go to **WINDOW**. Increase the size of  $X_{max}$ . Hit **GRAPH**.

4. Use the **INTERSECT** option to find where the two graphs intersect (the answer).

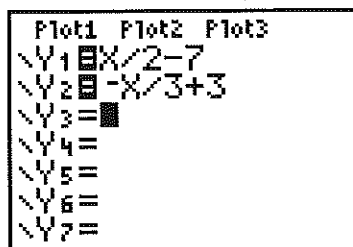
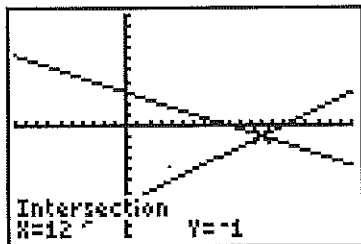
2nd TRACE (CALC) #5 intersect

Move spider close to the intersection.

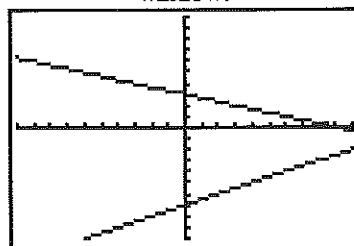
Hit **ENTER** 3 times.

5. Answer:  $x = 12$  and  $y = -1$

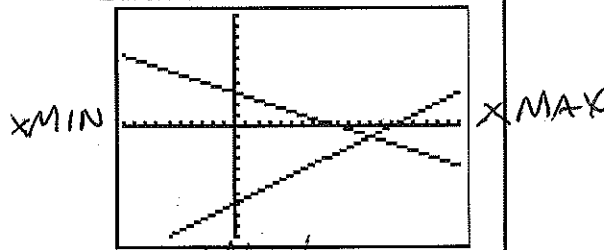
*Solution*  
(12, -1)



Oops!! They don't cross in the window.



Better!  $X_{max}$  was increased to 20.



*check*

$$1. \begin{cases} y = \frac{1}{3}x + 10 \\ y = x + 2 \end{cases} \quad \begin{aligned} 14 &= \frac{1}{3}(12) + 10 \\ 14 &= 14 \checkmark \\ 14 &= 12 + 2 \\ 14 &= 14 \checkmark \end{aligned}$$

Solution: (12, 14)

*check*

$$3. \begin{cases} y = -\frac{1}{2}x - 5 \\ y = -x + 1 \end{cases} \quad \begin{aligned} -11 &= -\frac{1}{2}(12) - 5 \\ -11 &= -6 - 5 \checkmark \\ -11 &= -(12) + 1 \\ -11 &= -11 \checkmark \end{aligned}$$

Solution: (12, -11)

$$2. \begin{cases} y = \frac{2}{3}x \\ y = \frac{1}{2}x - 1 \end{cases}$$

Solution: (-6, -4)

$$4. \begin{cases} y = x - 5 \\ y = 2x + 3 \end{cases}$$

Solution: (-8, -13)