5-1 day 3

## Graphing Calculator Activity
### *Solution to a System of Linear Equations*

A graphing calculator can be used to solve a system of linear equations graphically. The solution of a system of linear equations can be found by using the **TRACE** feature or by using the **intersect** command under the **CALC** menu.

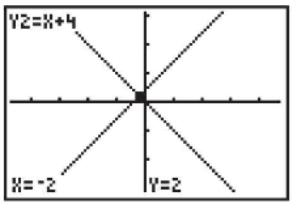
**Example: Solve each system of linear equations.**

**a.** $x + y = 0$
$x - y = -4$ } solve for y.

**Using TRACE:** Solve each equation for y and enter each equation into **Y=**.Then graph using **Zoom 8: ZInteger**. Use **TRACE** to find the solution.

Keystrokes: Y= (–) X,T,θ,n ENTER X,T,θ,n + 4 ZOOM 6 ZOOM 8 ENTER TRACE ◀ ◀.

The solution is (–2, 2).



[–47, 47] scl:10 by [–31, 31]
scl:10

$x+y=0$
$-1x \quad -1x$
$y=-1x$
$Y_1$

$x-y=-4$
$-1x \quad -1x$
$-1y=-1x-4$
$\frac{-1y}{-1}=\frac{-1x}{-1}-\frac{4}{-1}$
$y=x+4$
$Y_2$

****PREFERRED METHOD****

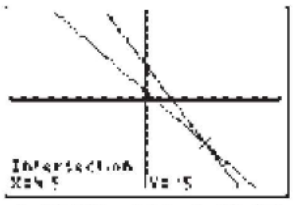
**b.** $2x + y = 4$
$4x + 3y = 3$ } solve for y

**Using CALC:** Solve each equation for *y*, enter each into the calculator, and graph. Use **CALC** to determine the solution

Keystrokes: Y= (–) 2 X,T,θ,n + 4 ENTER ( (–) 4 ÷ 3 ) X,T,θ,n + 1 ZOOM 6 2nd [CALC] 5 ENTER ENTER ENTER.

To change the *x*–value to a fraction, press 2nd [QUIT] X,T,θ,n MATH ENTER ENTER.

The solution is (4.5, –5) or $\left(\frac{9}{2}, -5\right)$.



[–10, 10] scl:1 by [–10, 10]
scl:1

$2x+y=4$
$-2x \quad -2x$
$y=-2x+4$
$Y_1$

$4x+3y=3$
$-4x \quad -4x$
$\frac{3y}{3}=\frac{-4x}{3}+\frac{3}{3}$
$y=-\frac{4}{3}x+1$
$Y_2$

**Exercises**

**Solve each system of linear equations. Remember, in order to graph the equations in the calculator, each equation must be solved for y first.**

**1.** $y = 2$
$5x + 4y = 18$

Solution: (2,2)

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

Solution: (1,2)

Independent Class Work:
Solve for y (if necessary), enter equations into $Y_1$ or $Y_2$, do 2nd trace, enter 3 times to find the solution.

**3.** $x + y = -1$
$2x - y = -8$

Solution: (-3,2)

**4.** $-3x + y = 10$
$-x + 2y = 0$

Solution: (-4,-2)