Intersecting the Solution
Student Activity

Name ________________
Class ________________

Problem 1 – Solving Graphically

1. Solve the following system of equations using an algebraic method, substitution, or elimination.

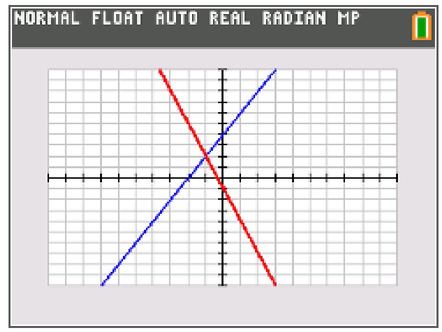
$y = 2x + 4$
$y = -3x - 1$

Show your work and record your solution below:

Solution: x = _____; y = _______

Now use the calculator to solve the system of equations graphically. Press [y=] and enter the equations next to **Y1** and **Y2**.

Then press [zoom] and select **ZStandard** to get a graphing window with values from –10 to 10 as well as to observe the graphs of the two equations.

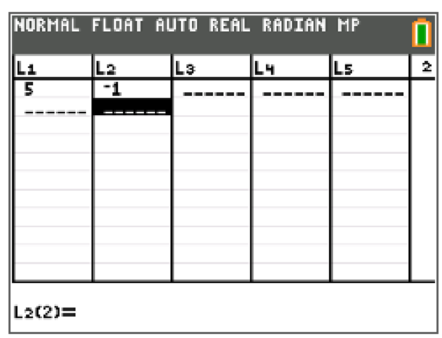


To find the point of intersection, press [2nd] [calc] and choose **intersect**. Now, move the cursor to the observed point of intersection and press [enter] three times.

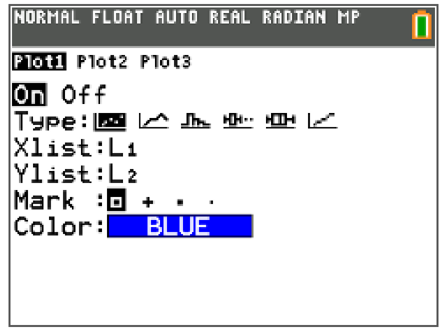
2. How is the point of intersection related to the algebraic solution of a system of equations?

Problem 2 – Creating a System of Equations

Press [stat] [enter] and enter **5** in list **L1** and **–1** in list **L2**. Make sure the list is empty before entering the values.

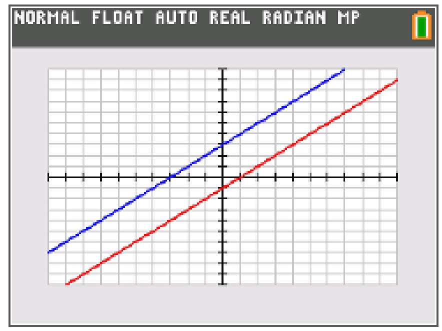


Press [2nd] [stat plot] and set up **Plot1** to graph a scatter plot of **L1** and **L2**. This will plot the point (5, –1).



Enter the equations **Y= 1X+3** and **Y=1X–1** into the **Y=** screen next to **Y1** and **Y2**.

Press [graph] and observe that the two lines do not intersect. Change the values of the integers in these equations so that they intersect at the point (5, –1).



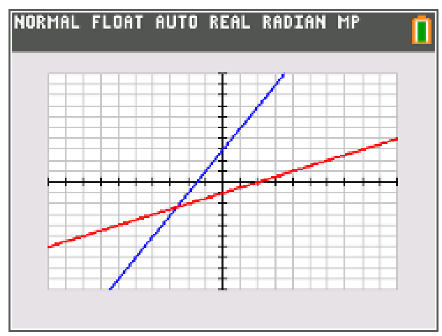
3. Record the equations of the lines:

Have your partner solve your system of equations algebraically to confirm the solution is the intersection point, or use the **intersect** command.

Problem 3 – Infinite or No Solutions

Enter the equations **Y= 2X+3** and **y = 0.5X–1** in the **Y=** screen and observe that the two lines intersect.

Change the values of the coefficients and constants in these equations so that they do not intersect.



4. Record your equations:

5. What do the equations or lines have to have in common so that they do not have a solution?

Now, change the values of the integers so they represent a system of equations with infinite solutions.

6. Record your equations:

7. What do the equations or lines need to have in common to have infinite solutions?