



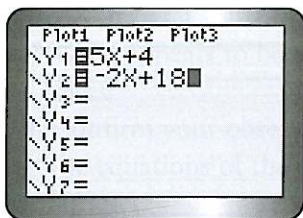
1.6 Determining the Point of Intersection Using the TI-83 Plus Calculator

More than one graph can be drawn at the same time on the TI-83 Plus graphing calculator. This feature allows you to represent simple linear systems, involving two equations. The point of intersection can be found in two ways, one way being more accurate than the other.

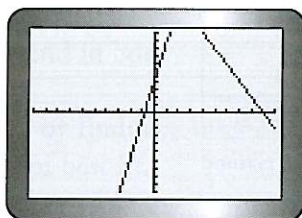
Investigate both methods using the equations $y = 5x + 4$ and $y = -2x + 18$.

Approximating the Point of Intersection

1. Enter both linear equations into the equation editor.
2. Then press **GRAPH**. The point of intersection is out of view in a window from -10 to 10 .

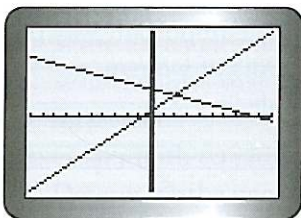


step 1

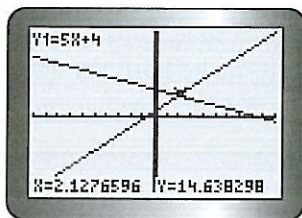


step 2

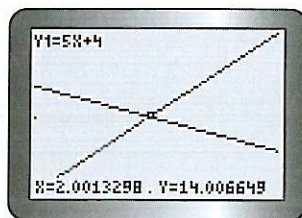
3. Use **0:ZoomFit** to display the point of intersection. Press **ZOOM** **0**.
4. Use the **TRACE** button and the left or right arrow keys to move the cursor to the point of intersection to get an approximation of the coordinates.
5. For a better approximation, use **2:Zoom In** by pressing **ZOOM** **2** **ENTER**. Relocate the cursor on the point of intersection and repeat as many times as needed.



step 3



step 4



step 5

Finding the More Accurate Point of Intersection

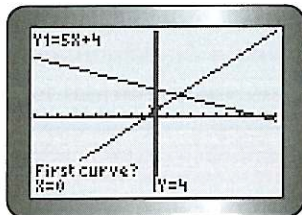
You can also use the TI-83 Plus to find a more accurate point of intersection. To begin, enter the equations and graph the lines, just as in steps 1 and 2 on the previous page. Then follow the steps below.

- To find the coordinates of the point of intersection, use the **intersect** command on the **CALC** menu. Press **[2nd]** **[TRACE]** **[5]**.

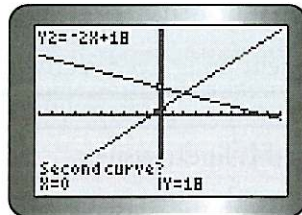


step 3

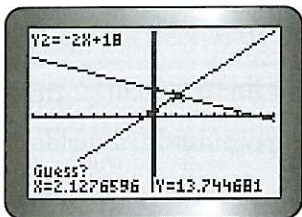
- You will be asked to verify the two curves and enter a guess (optional) for the point of intersection. Press **[ENTER]** after each screen appears.



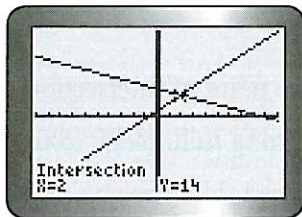
step 4



step 4 repeated



step 4 repeated again



step 4 repeated: a more accurate point of intersection

The point of intersection is (2, 14).

Practise 1.6

Locate the point of intersection for each linear system. First find an approximate location and then a more accurate location.

(a) $y = 2x + 1$
 $y = -x + 10$

(b) $y - 3x = 5$
 $y + 2x = -5$

(c) $x + 2y = -4$
 $-x + 2y = 2$

(d) $x + y = 39$
 $5x + 10y = 300$

(e) $40x + 500y = 830$
 $y = 3.5 - x$

(f) $4x + 5y = 90$
 $10x + 8y = 80$