

Solving on the TI-83/84

Step 1: Enter the left side of the equation into Y1 and the right side into Y2:

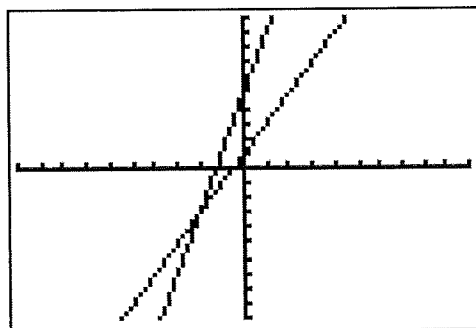
Example: $4x + 5 = 2x + 1$

```
Plot1 Plot2 Plot3
Y1=4X+5
Y2=2X+1
Y3=
Y4=
Y5=
Y6=
Y7=
```

Step 2: Graph on the Standard Window (Zoom-Standard)

Notes:

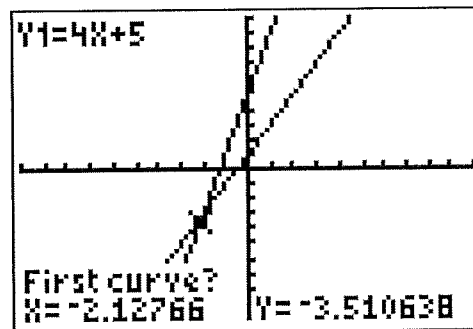
- Every time the graphs intersect represents a solution.
- If the graphs never cross, then there is no solution.
- If the graphs cross outside of the window, then you must change the window to see the intersections (see example 2 and 3).



Step 3: Press [2nd] [Calc] to enter the calculate menu. Select the option that says "Intersect"

```
CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```

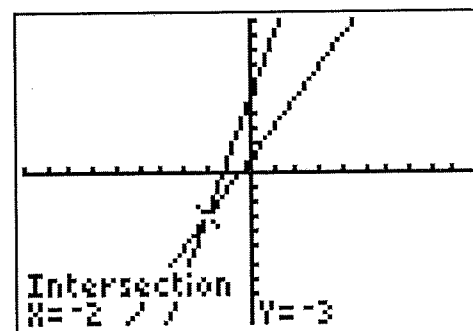
Step 4: Use the left and right buttons to scroll close to the intersection point. Then press [enter] three times for the prompts that say "First curve" "Second curve" and "Guess"



The x-value of the Intersection is the solution.

Answer to the example: $x = -2$

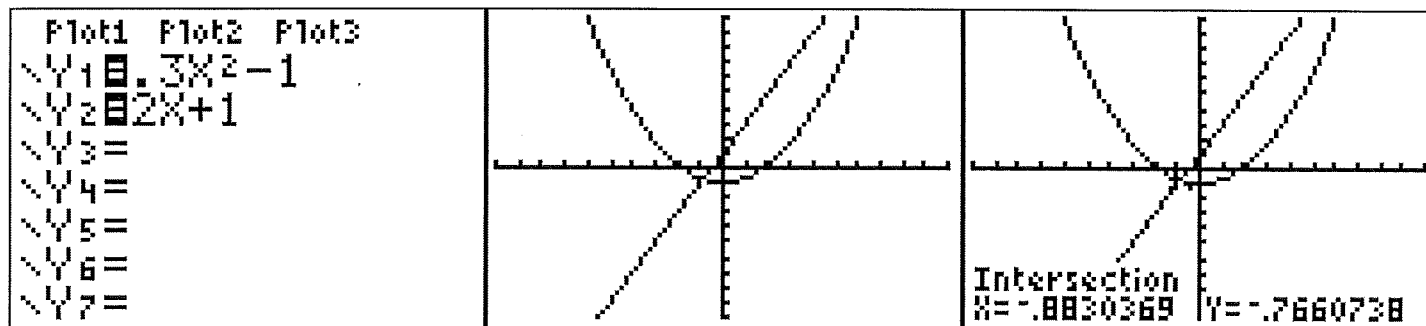
Repeat this process for each intersection point.



Example 2: Two intersection points, one of which is above the standard window.

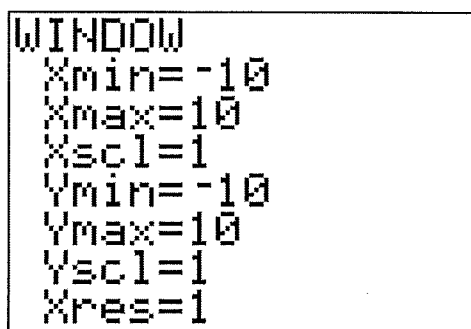
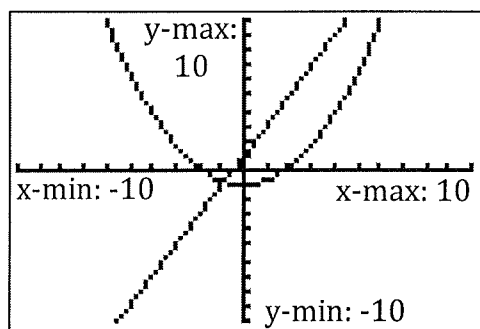
Solve: $0.3x^2 - 1 = 2x + 1$

Finding the intersection point that is on the viewing window:

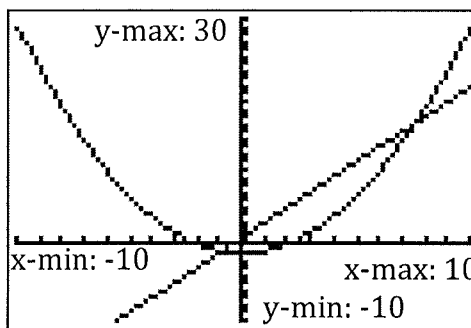
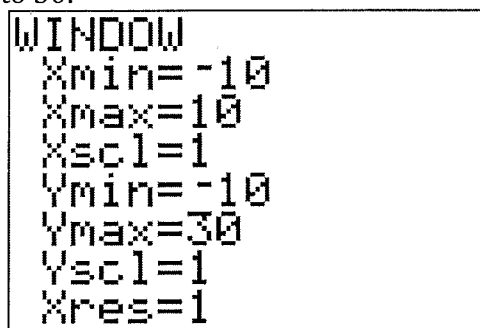


So the first solution is $x = -.883$

It appears that the lines will intersect again above the viewing window. The viewing window is shown with the max/mins displayed in text. These values can be changed by pressing [window].

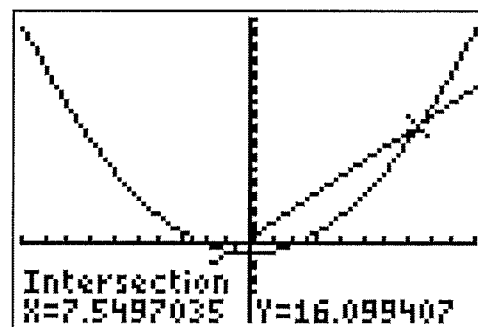


To see more above the screen, the Y-Max will be changed to a larger value. For this example, Y-Max will be set to 30.



Now that the second intersection point can be seen, repeat the process of finding the intersection. Make sure to scroll close to the new intersection point (on the right) before pressing [enter] three times.

The second solution is $x = 7.550$



Example 3: Find an intersection to the right of the standard window.

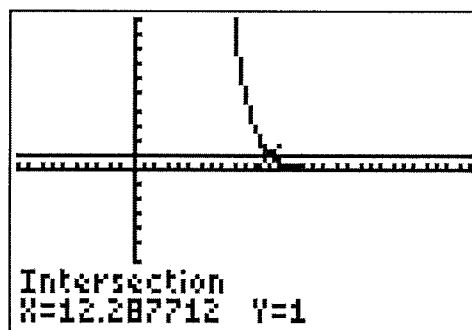
Solve: $5000(0.5)^x = 1$

Finding the intersection point that is on the viewing window:

Enter Equations	Standard Window Lines will cross further right	Change Xmax to 30
<pre> Plot1 Plot2 Plot3 Y1=5000(.5)^X Y2=1 Y3= Y4= Y5= Y6= Y7= </pre>		<pre> WINDOW Xmin=-10 Xmax=30 Xscl=1 Ymin=-10 Ymax=10 Yscl=1 Xres=1 </pre>

Now the lines intersect and the solution can be found.

Solution: $x = 12.288$



Alternate Method

Rather than try to change one specific window value, try zooming out. Press [zoom] and select Zoom Out.

	<pre> ZOOM MEMORY 1:ZBox 2:Zoom In 3:Zoom Out 4:ZDecimal 5:ZSquare 6:ZStandard 7↓ZTrig </pre>
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After selecting zoom out, a cursor appears to center the new screen. Press [enter] to select the origin. Then repeat the process of finding the intersection point.

Solution $x = 12.288$

