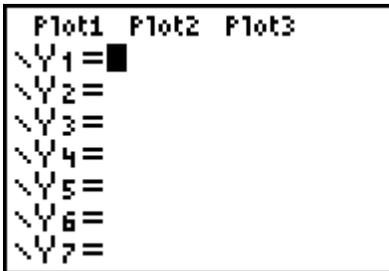


How to find the intersection of two functions

Introduction: In this exercise you will learn how to graph two functions and then find the point of intersection or intersections.

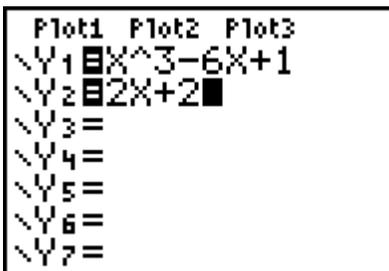
How to Graph two Equations:

1. Turn your calculator $\boxed{\text{ON}}$.
2. Hit the $\boxed{\text{Y=}}$. This is what you should see on your screen.



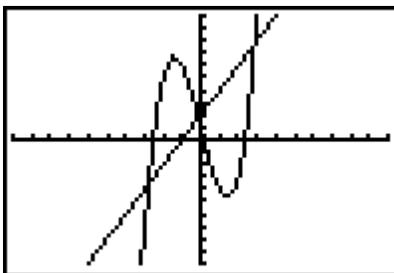
```
Plot1 Plot2 Plot3
\Y1=
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

3. We are now going to put these two equations into our calculator. In the Y1 part type $\boxed{\text{X,T,}\theta,n}\boxed{\wedge}\boxed{3}\boxed{-}\boxed{6}\boxed{\text{X,T,}\theta,n}\boxed{+}\boxed{1}$. This is the equation $x^3 - 6x + 1$. In the Y2 part type $\boxed{2}\boxed{\text{X,T,}\theta,n}\boxed{+}\boxed{2}$. This is the equation $2x + 2$. This is what your screen should look like:



```
Plot1 Plot2 Plot3
\Y1=X^3-6X+1
\Y2=2X+2
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

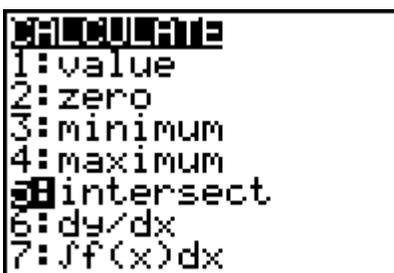
4. After you have successfully typed your equations in, hit the $\boxed{\text{GRAPH}}$ button. This is what your graph should look like:



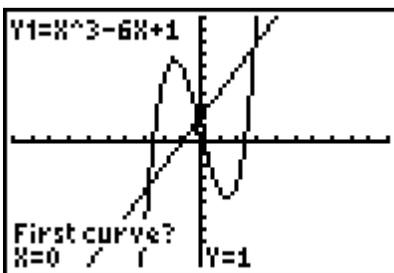
Finding the intersection point(s) of a graph

While your graphs of the two functions are still displayed on your screen, follow these steps. (The intersection must appear on the display to use **intersect**.)

1. Go to the calculate menu. To do this you will hit the **2nd****TRACE** buttons. Hit the **▼** arrow until you see the number 5 highlighted.



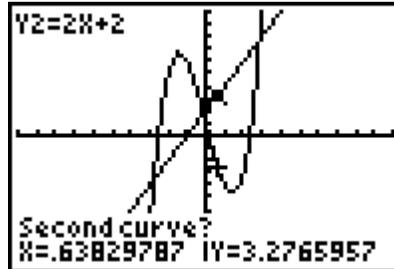
Then hit the **ENTER** button. On your screen should be something asking you for the first curve. Your screen should look like this:



Your cursor should be on the function $x^3 - 6x + 1$ since this was the first function you typed in. Hit the **◀** or **▶** buttons to make sure. Hit the **▲** or

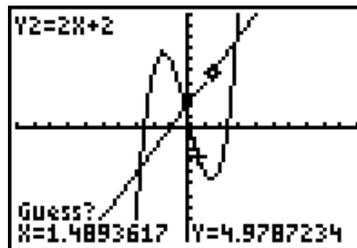
▾ buttons to move your cursor from one function to the other. Once your cursor is on the function $x^3 - 6x + 1$ hit **ENTER**.

2. You should now see this on your screen:



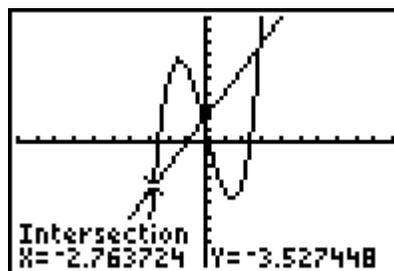
It is asking you for the second curve that we entered. This is the equation $2x + 2$. Again hit **◀** or **▶** buttons to make sure your cursor is there and then hit **ENTER**.

3. You should now see *Guess?* on the screen.



This is where you **think** the two lines intersect. Move your cursor to the left most point of intersection by using the **◀** or **▶** buttons. Once you think you are in a pretty good spot, hit the **ENTER** key.

4. The cursor, depending on how close you were, has moved to the correct point of intersection.



Try this process for the other two points of intersection and see how close you can come to the correct answer.

by Jesse Whitehouse, Kutztown University, 2002