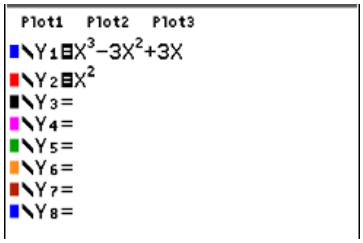
Chapter 10 / **Example 14**
Find the area of a region bounded by curves

Find the area of the region between the curves $f(x)=x^3-3x^2+3x$ and $g(x)=x^2$.

Press [f1] [y=] to display the equation entry screen.

Type x^3-3x^2+3x and press [enter] to enter the equation as Y_1.

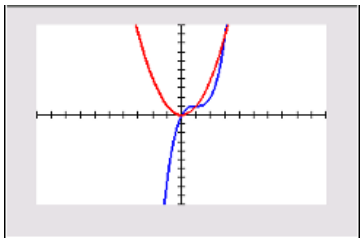
Type x^2 and press [enter] to enter the equation as Y_2.



Press [f5] [graph] to display the graph screen.

The GDC now displays the curves $Y_1=x^3-3x^2+3x$ and $Y_2=x^2$.

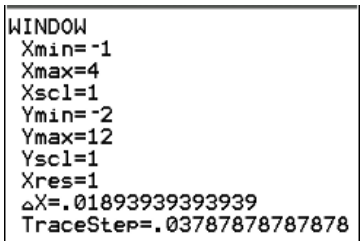
The default axes are $-10\le x\le 10$ and $-10\le y\le 10$.



Press [f2] [window].

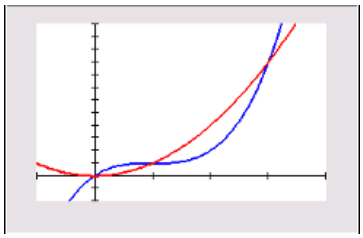
Set the axes to show $-1\le x\le 4$ and $-2\le y\le 12$

Set the scales to 1.



Press [f5] [graph]

The GDC displays the curve $Y_1=x^3-3x^2+3x$ and $Y_2=x^2$ in a suitable window.

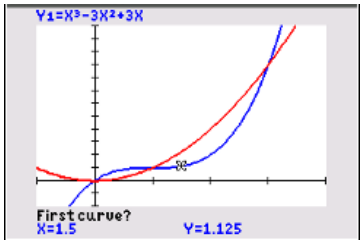


Press [2nd] [f4] [calc] 5:intersect

To find the intersection you need to choose the two lines that intersect.

The GDC shows a cross on one of the lines and 'First curve?'.

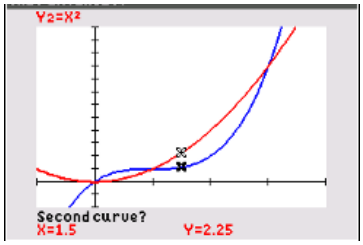
Press [enter].



Chapter 10 / **Example 14**
Find the area of a region bounded by curves

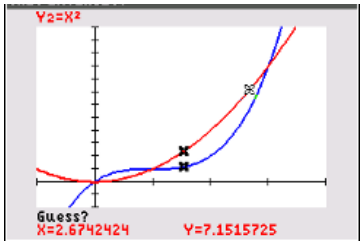
The GDC shows a cross on the other line and 'Second curve?'.

Press enter.

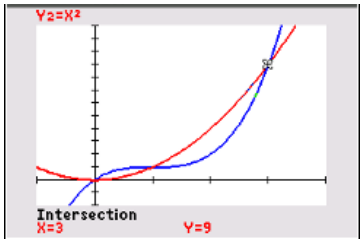


The GDC requires an initial guess for the position of the intersection. Choose a point near the right-hand intersection by pressing ◄ ►.

Press enter.

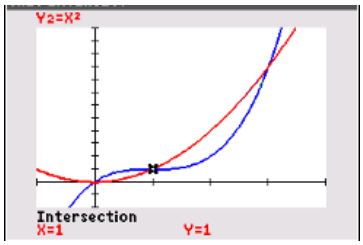


The GDC displays the intersection of the two straight lines at the point $(3, 9)$.



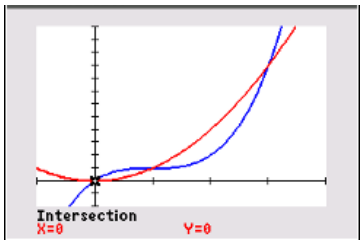
Find the second intersection by the same method.

The GDC displays the intersection of the two straight lines at the point $(1, 1)$.



Confirm the third intersection by the same method.

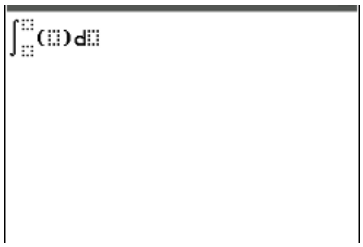
The GDC displays the intersection of the two straight lines at the point $(0, 0)$.



Press 2nd [quit] to enter the home screen.

To enter the integral template press [MATH] [f2] 4:fnInt(and to enter Y_1 by press [VARS] [f4] 1:Y_1 and Y_2 by press [VARS] [f4] 2:Y_2

Older models of the TI-84 that use Classic display may not have the ability to show MathPrint and will show fnInt(instead. It may be possible to change between Classic and MathPrint display using mode.



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Find the area of a region bounded by curves

There are four fields to complete in the template: one for each of the limits, the function you are integrating and the variable you are integrating with respect to.

Use the ▶ ◀ ▲ ▼ keys to navigate the template.

Enter $\int_0^1 (Y_1(x) - Y_2(x))\,dx + \int_1^3 (Y_2(x) - Y_1(x))\,dx$

The area is 3.0833 to 4dp.