

Chapter 8 / **Example 2**

Finding the area between graphs

Find the total area enclosed by the graph $f(x) = x^3 - 2x + 1$ and its reflection in the x -axis.

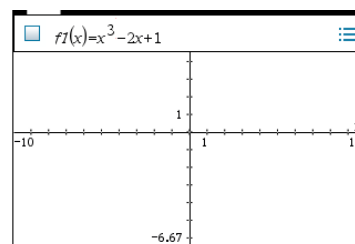
Open a new document and add a Graphs page.

The entry line is displayed at the top of the work area.

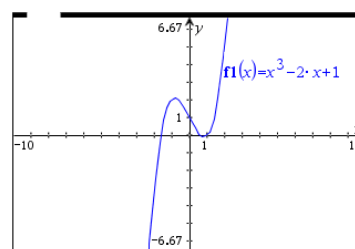
The default graph type is function, so ' $f1(x)=$ ' is displayed.

The default axes are $-10 \leq x \leq 10$ and $-6.67 \leq y \leq 6.67$.

Type $x^3 - 2x + 1$.



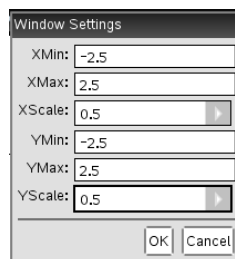
Press **enter**. The GDC displays the curve $f1(x) = x^3 - 2x + 1$ in the default window.



Press **menu** 4:Window/Zoom | 1:Window Settings...

Set the axes to show $-2.5 \leq x \leq 2.5$ and $-2.5 \leq y \leq 2.5$ with scales of 0.5.

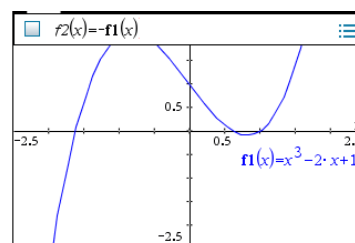
Press **enter** when you have finished.



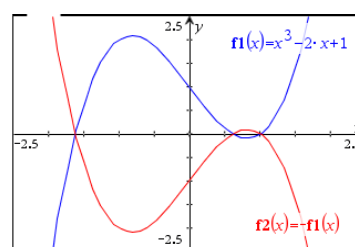
The reflection of the curve $f1(x)$ in the x -axis is $-f1(x)$

Press **tab** to display the entry line again. This time ' $f2(x)=$ ' is displayed.

Type $-f1(x)$ and press **enter**.



The GDC displays the curve $f1(x) = x^3 - 2x + 1$ and its reflection in the x -axis.



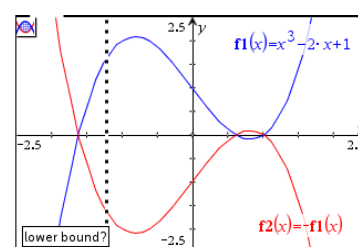
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Finding the area between graphs

Calculate the area bounded by the curve and the line using the built-in function of the GDC.

Press **menu** 6:Analyze Graph | 7:Bounded Area.

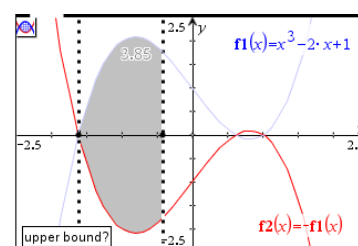
The GDC asks for a lower bound.



Use the touchpad to position the cursor so that it shows the left-hand intersection point.

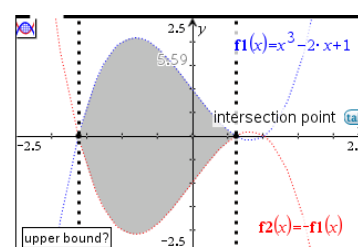
Click the touchpad.

The GDC asks for an upper bound.



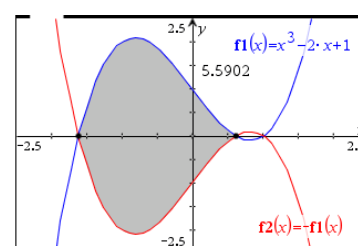
Position the cursor over the next intersection point.

Click the touchpad.



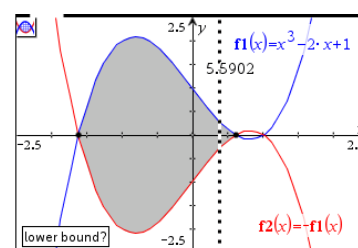
The GDC has calculated the area between the curve and the line.

The area of the region is 5.59.



To find the area of the next region between the two curves press **menu** 6:Analyze Graph | 7:Bounded Area.

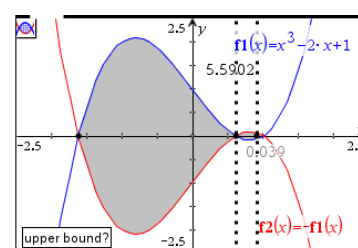
The GDC asks for a lower bound.



Use the touchpad to position the cursor so that it shows the middle intersection point.

Click the touchpad.

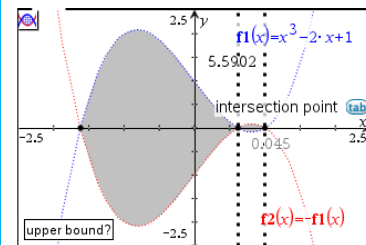
The GDC asks for an upper bound.



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Position the cursor over the right-hand intersection point.
Click the touchpad.



The GDC has calculated the area between the curves.

The area of the region is 0.0451.

The total area is $5.59 + 0.0451 = 5.64$.

