

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.

Press **MENU** 5 **GRAPH** to display the equation entry screen.

Type $x^3 - 2x + 1$ and press **EXE** to enter the equation as Y1.

Graph Func : Y=
Y1: $x^3 - 2x + 1$ [—]
Y2: [—]
Y3: [—]
Y4: [—]
Y5: [—]
Y6: [—]
[SELECT] [DELETE] [TYPE] [TOOL] [MODIFY] [DRAW]

Choose suitable window settings to display the graph.

Press **SHIFT** **F3** V-WIN.

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.

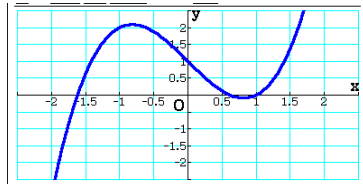
You can leave the other items as they are.

Press **EXIT** when you have finished.

View Window
max : 2.5
scale : 0.5
dot : 0.01322751
Ymin : -2.5
max : 2.5
scale : 0.5
[INITIAL] [TRIG] [STANDARD] [V-MEM] [SQUARE]

Press **F6** DRAW to display the graph screen.

The GDC now displays the function $Y1 = x^3 - 2x + 1$ in a suitable window.



The reflection of the curve Y1 in the x -axis is $-Y1$.

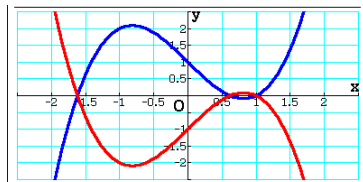
Press **EXIT** to display the equation entry screen.

Type $-$ and press **VAR** **F4** GRAPH **F1** Y and type 1 and press **EXE** to enter the equation as Y2.

Graph Func : Y=
Y1: $x^3 - 2x + 1$ [—]
Y2: $-Y1$ [—]
Y3: [—]
Y4: [—]
Y5: [—]
Y6: [—]
[SELECT] [DELETE] [TYPE] [TOOL] [MODIFY] [DRAW]

Press **F6** DRAW to display the graph screen.

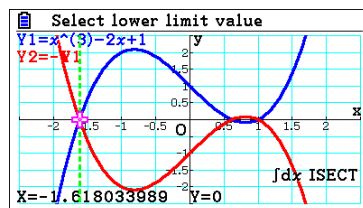
The GDC displays the curve $Y1 = x^3 - 2x + 1$ and its reflection in the x -axis.



To find the area of the region between the two curves press **F5** G-SOLVE **F6** \triangleright **F3** $\int dx$ **F3** INTSECT.

The GDC asks you to select the lower limit value, which is shown as $x = -1.62$.

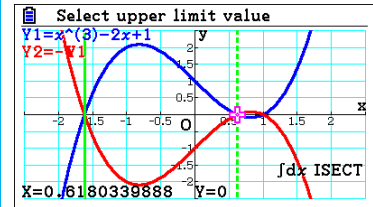
Press **EXE**.



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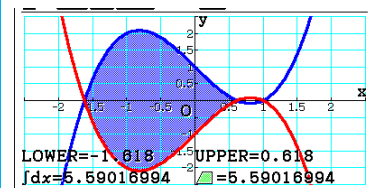
The GDC asks you to select the upper limit value.

Press \blacktriangleright to select the next intersection at 0.618 and press $\boxed{\text{EXE}}$.



The GDC has calculated the area between the curves between the limits -1.62 and 0.618 .

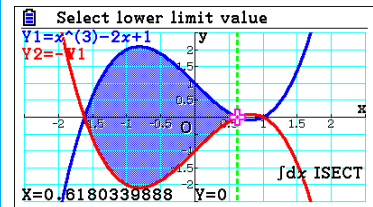
The area of the region is 5.59 .



To find the area of the next region between the two curves press $\boxed{\text{F5}}$ G-SOLVE $\boxed{\text{F6}}$ \blacktriangleright $\boxed{\text{F3}}$ $\int dx$ $\boxed{\text{F3}}$ INTSECT.

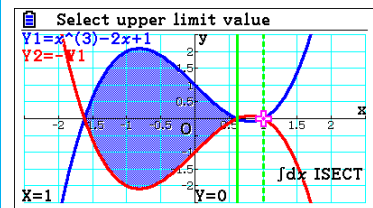
The GDC asks you to select the lower limit value.

Press \blacktriangleright to select the next intersection at 0.618 and press $\boxed{\text{EXE}}$.



The GDC asks you to select the upper limit value.

Press \blacktriangleright to select the next intersection at 1 and press $\boxed{\text{EXE}}$.



The GDC has calculated the area between the curves between the limits 0.618 and 1 .

The area of the region is 0.0451 .

The total area is $5.59 + 0.0451 = 5.64$

