

## Volume of revolution –Part 2

*This resource was written by Derek Smith with the support of CASIO New Zealand. It may be freely distributed but remains the intellectual property of the author and CASIO.*

Select GRAPH mode and RUN mode from the main menu by using the arrow keys: - to highlight the RUN icon or pressing 1.



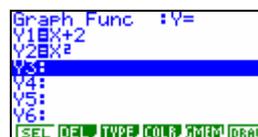
- to highlight the GRAPH icon or pressing 5.



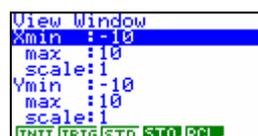
Volume of revolution  $V = \int \pi [f(x)]^2 dx$ , where a and b are the lower and upper bound respectively.

**Example:** Find the volume generated by revolving the area between the line  $y = x + 2$  and  $y = x^2$  about the x axis.

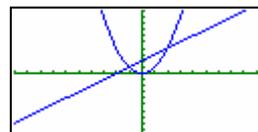
**Answer:** A picture of what is required is helpful here.  
In **GRPH** Mode, Press **5** from the **MAIN MENU**  
Enter into the calculator  $y = x + 2$  and  $y = x^2$   
Into the Y1 and Y2 spaces.



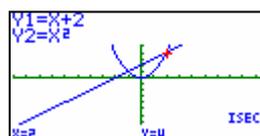
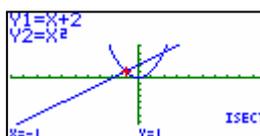
Set up the **VIEW-Window** to a **STD** window, **F3**, then **EXIT**.



Draw the graphs of  $y = x + 2$  and  $y = x^2$  by pressing **F6** or the **EXE** key.



Now, a **G-SOLVE**, **SHIFT** **F5**, then **F5** to find the intersection points.



The intersection points are  $(-1, 1)$  and  $(2, 4)$ .

Once the intersection points have been found the volume of revolution formula can be used in **RUN Mode**, from the main menu.

The x –values are  $x = -1$  and  $x = 2$  for the lower and upper bound of the integration.

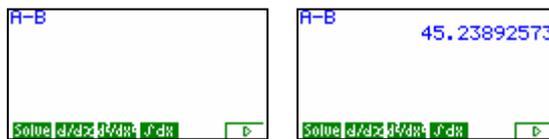
Enter in  $\int \pi (x+2)^2, -1, 2$  then press **EXE** record the answer, by storing it in a memory space.



Enter in  $\int \pi(x^2)^2, -1, 2$  then press **EXE** record the answer, by storing it in a memory space.



Calculate the answer A – B



The volume generated is **45.239 (3 d.p.) units<sup>3</sup>**