

# Simpsons Rule

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 **TABLE** mode from the main menu by using the arrow keys to highlight the **TABLE** icon or pressing 7.

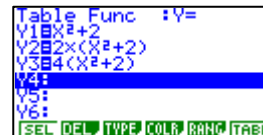


Note: 
$$\text{Area} = \frac{1}{3}h[y_0 + 2y_1 + 4y_2 + 2y_3 + \dots + 4y_{n-2} + 2y_{n-1} + y_n]$$
 Where 
$$h = \frac{x_n - x_0}{n}$$

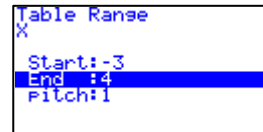
The number of steps for using Simpsons Rule has to be even.

**Example:** Calculate the area bounded by the x-axis and the curve  $y = x^2 + 2$  between  $x = -2$  and  $x = 4$ , in steps of 1.

**Answer:** Enter **TABLE** mode and enter in the function  $x^2 + 2$  in the Y1 space and  $2(x^2 + 2)$  in the Y2 space.  $4(x^2 + 2)$  in the Y3 space.



Select **F5 RANGE** to enter  $x = -3$ , the **Start** value and  $x = 4$ , the **End** value and **pitch** to 1, being the step length. Then **EXIT**.



To create the table of values, x, Y1 and Y2 press the **F6** key

X	Y1	Y2	Y3
-2	11	22	44
-1	6	12	24
0	3	6	12
1	5	10	20
2	8	16	32
3	11	22	44
4	18	36	72

X	Y1	Y2	Y3
1	3	6	12
2	6	12	24
3	11	22	44
4	18	36	72

Reading off the required values from Y1 only:

**Area** = ?  $\times 1 \times [11 + 4 \times 6 + 2 \times 3 + 4 \times 2 + 2 \times 3 + 4 \times 6 + 2 \times 11 + 18]$   
 = ?  $[11 + 24 + 6 + 8 + 6 + 24 + 22 + 18]$   
 = ?  $[119]$   
 = **39? sq units**

**OR** reading off the required values from Y1, Y2 and Y3:

**Area** = ?  $[11 + 24 + 6 + 8 + 6 + 24 + 22 + 18]$   
 = ?  $[119]$   
 = **39? sq units**