

# Trapezium Rule

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

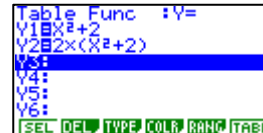


Note: 
$$\text{Area} = \frac{1}{2}h[y_0 + 2y_1 + 2y_2 + \dots + 2y_{n-1} + y_n]$$
 Where 
$$h = \frac{x_n - x_0}{n}$$

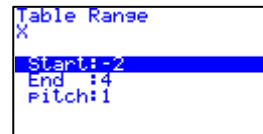
Also known as the trapezoidal rule

**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.



Select **F5 RANGE** to enter  $x = -2$ , 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
-2	6	12
-1	3	6
0	2	4
1	3	6

X	Y1	Y2
1	3	6
2	6	12
3	11	22
4	18	36

Reading off the required values from Y1:

$$\begin{aligned} \text{Area} &= \frac{1}{2} \times 1 \times [6 + 2 \times 3 + 2 \times 2 + 2 \times 3 + 2 \times 6 + 2 \times 11 + 18] \\ &= 0.5 \times [6 + 6 + 4 + 6 + 12 + 22 + 18] \\ &= 0.5 \times 74 \\ &= 37 \text{ sq units} \end{aligned}$$

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

$$\begin{aligned} \text{Area} &= \frac{1}{2} \times 1 \times [6 + 6 + 4 + 6 + 12 + 22 + 18] \\ &= 0.5 \times 74 \\ &= 37 \text{ sq units} \end{aligned}$$