

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

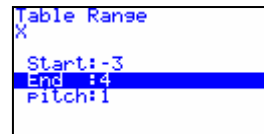
The number of steps for using Simpsons Rule has to be even.

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
-3	11	22	44
-2	6	12	24
-1	3	6	12
0	2	4	8
1	3	6	12
2	6	12	24
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:

$$\begin{aligned} \text{Area} &= \frac{1}{3} \times 1 \times [11 + 4 \times 6 + 2 \times 3 + 4 \times 2 + 2 \times 3 + 4 \times 6 + 2 \times 11 + 18] \\ &= \frac{1}{3} [11 + 24 + 6 + 8 + 6 + 24 + 22 + 18] \\ &= \frac{1}{3} [119] \\ &= 39\frac{2}{3} \text{ sq units} \end{aligned}$$

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

$$\begin{aligned} \text{Area} &= \frac{1}{3} [11 + 24 + 6 + 8 + 6 + 24 + 22 + 18] \\ &= \frac{1}{3} [119] \\ &= 39\frac{2}{3} \text{ sq units} \end{aligned}$$