**Rectangle method:**

In [mathematics](http://en.wikipedia.org/wiki/Mathematics), specifically in [integral calculus](http://en.wikipedia.org/wiki/Integral_calculus), the **rectangle method** (also called the *midpoint* or *mid-ordinate rule*) computes an [approximation](http://en.wikipedia.org/wiki/Approximation) to a [definite integral](http://en.wikipedia.org/wiki/Definite_integral), made by finding the [area](http://en.wikipedia.org/wiki/Area) of a collection of [rectangles](http://en.wikipedia.org/wiki/Rectangle) whose heights are determined by the values of the function.

Specifically, the interval (a,b)over which the function is to be integrated is divided into Nequal subintervals of length h = (b-a)/N. The rectangles are then drawn so that either their left or right corners, or the middle of their top line lies on the [graph](http://en.wikipedia.org/wiki/Graph_of_a_function) of the function, with bases running along the x-axis. The approximation to the integral is then calculated by adding up the areas (base multiplied by height) of the Nrectangles, giving the formula:

\int_a^b f(x)\,dx \approx h \sum_{n=0}^{N-1} f(x_{n})

where h = (b - a) / Nand x_{n} = a + nh .

The formula for x_{n}above gives x_{n}for the Top-left corner approximation.

As *N* gets larger, this approximation gets more accurate. In fact, this computation is the spirit of the definition of the [Riemann integral](http://en.wikipedia.org/wiki/Riemann_integral) and the [limit](http://en.wikipedia.org/wiki/Limit_of_a_sequence) of this approximation as n \to \inftyis defined and equal to the integral of fon (a,b)if this Riemann integral is defined. Note that this is true regardless of which i'is used, however the midpoint approximation tends to be more accurate for finite n.