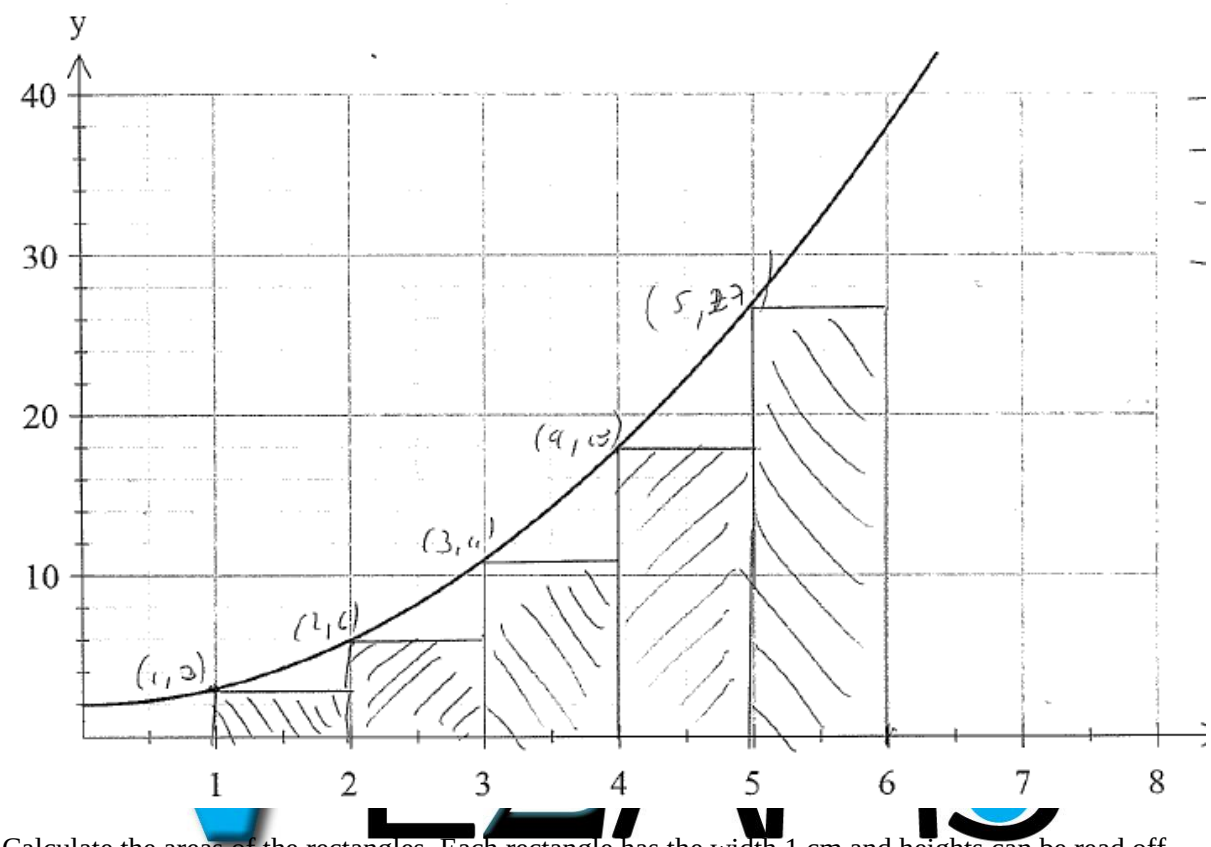
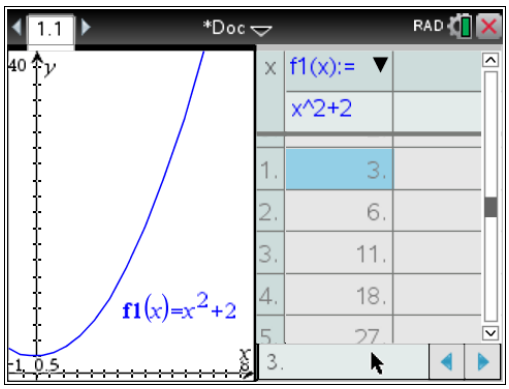
Numerical integration. Estimating the area under the graph.

Consider the function $f(x) = x^2 + 2$. Estimate the area under the graph between $x = 1$ and $x = 6$ using the left-point estimate and the right-point estimate.

Left-point estimate.

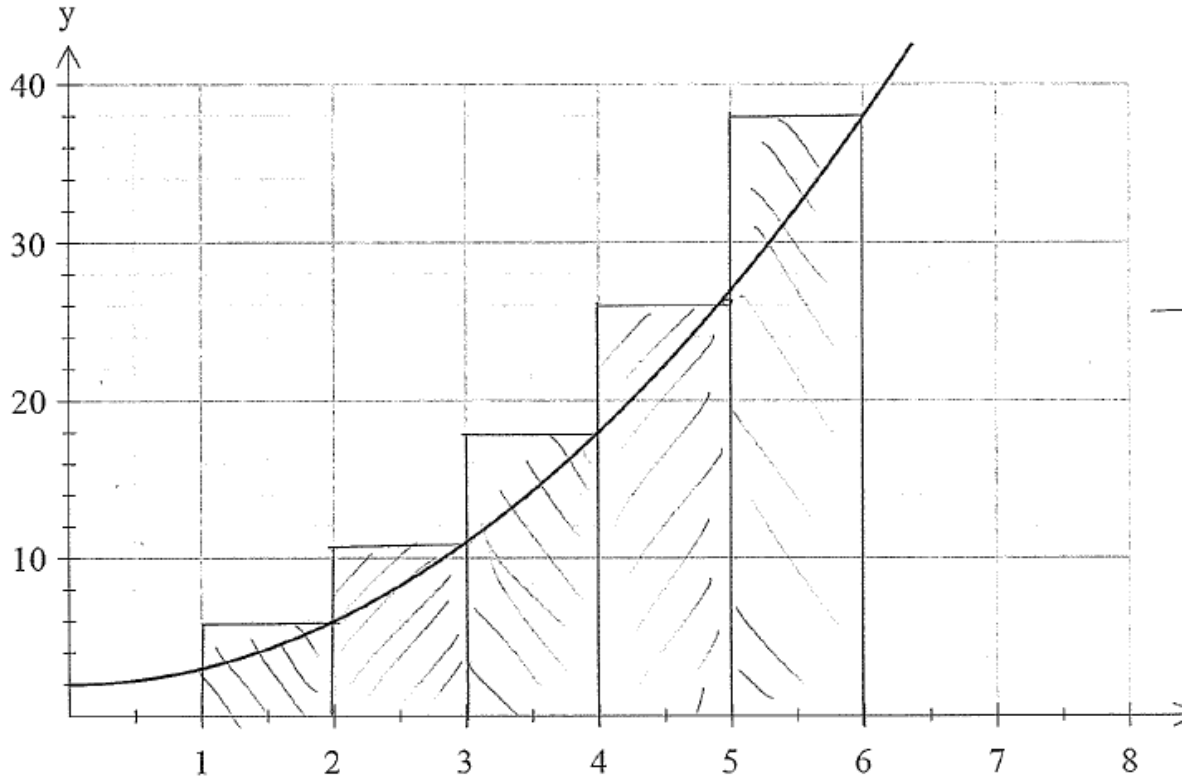


Calculate the areas of the rectangles. Each rectangle has the width 1 cm and heights can be read off the calculator table:



Sum of the areas of the rectangles = 65 units squared

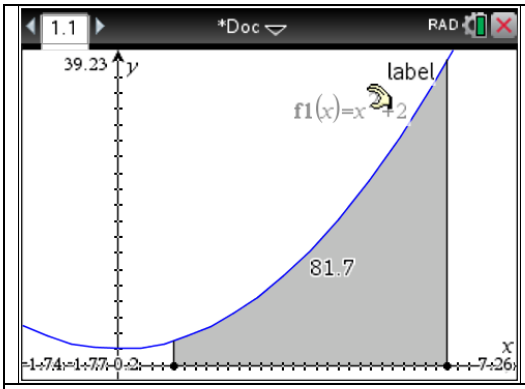
Right-endpoint estimate.

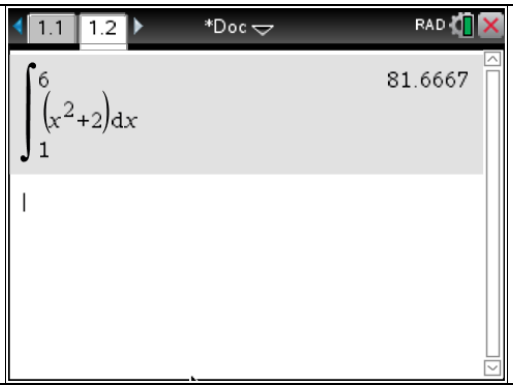


Sum of the areas of the rectangles = 100

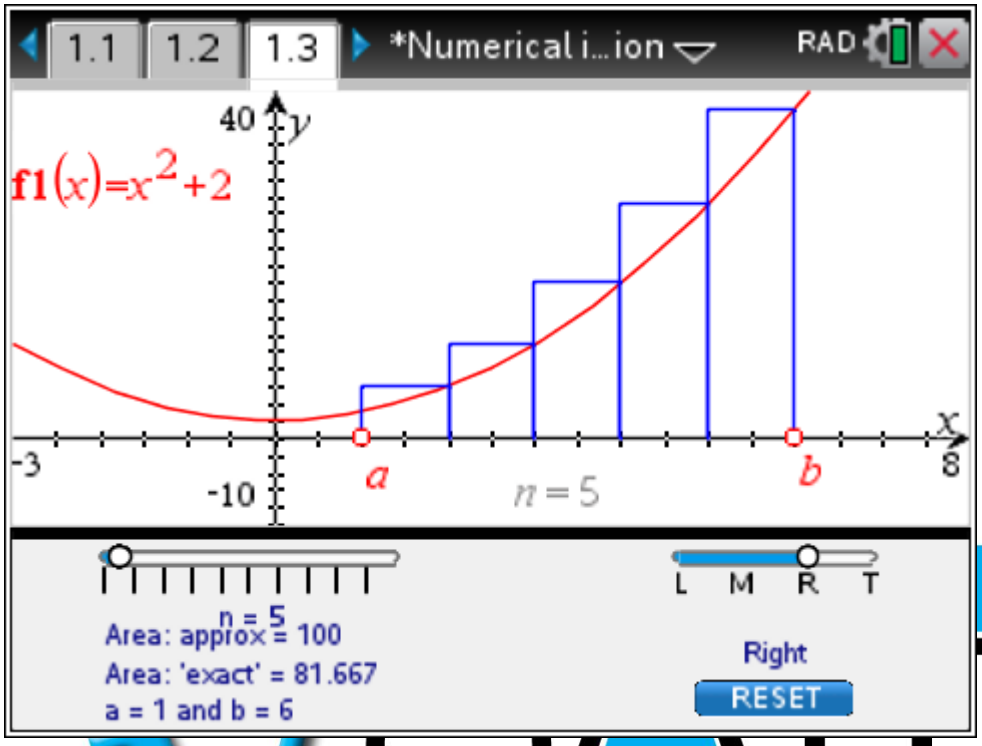
We can conclude that the area lies between 65 and 100.

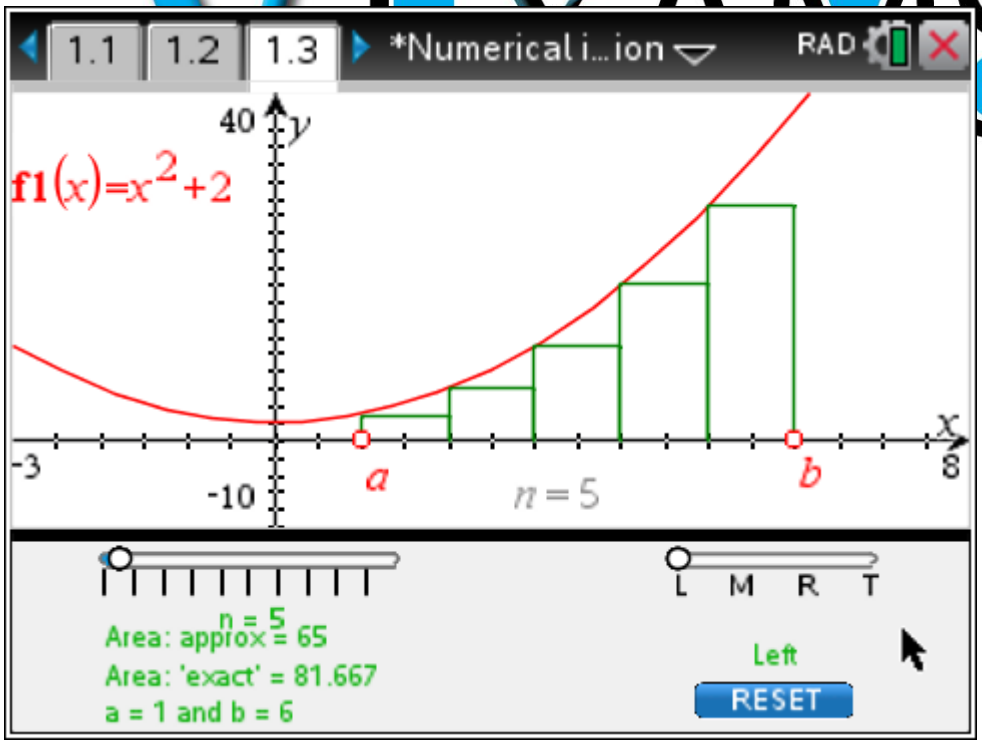
The actual area is 81.7

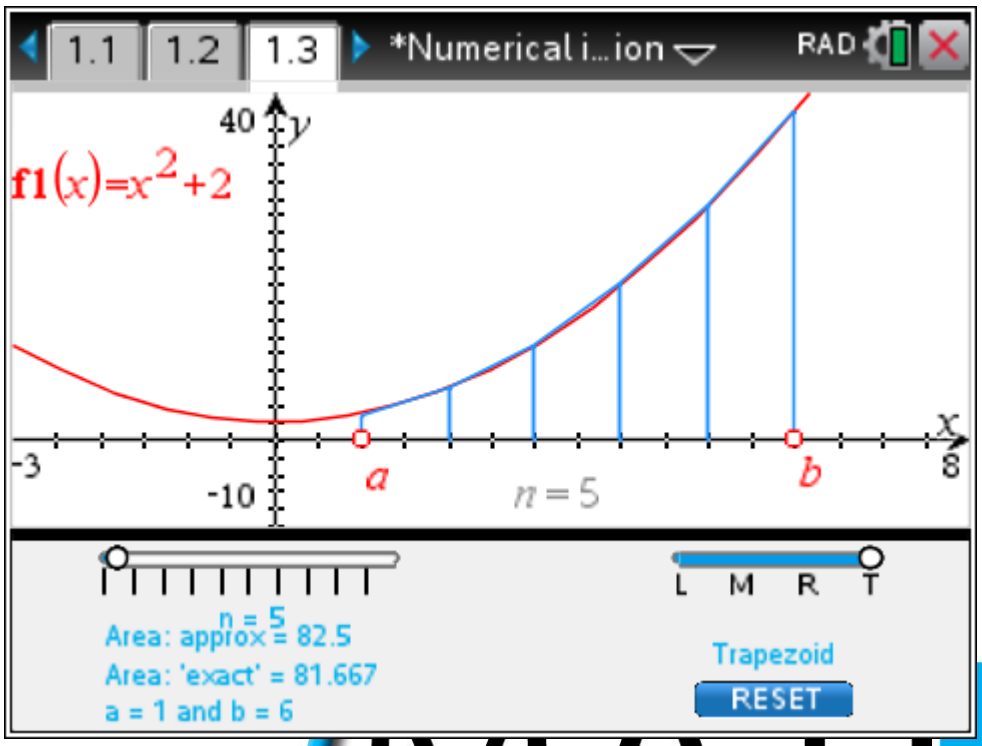




Using the program:







Increasing the number of intervals.