

Riemann Sums Demonstration Activity

- 1) Open the Riemann Sums Demonstration located at <http://demonstrations.wolfram.com/RiemannSums/>
- 2) First get familiar with the various options. Choose a function. Choose a height method. Adjust the slider for the number of rectangles (you can animate by pressing play).
- 3) Let $f(x) = x^2 - 1$.
 - a) Using 4 rectangles, find the left, midpoint and right sums by hand. Verify your answers using the demonstration.

Left _____

Midpoint _____

Right _____

- b) Find the exact area using an integral and compare. Which method above got closest to the exact area?

- 4) Still using the demonstration for $x^2 - 1$, find the number of rectangles needed to get within 0.1 of the exact area for each of the three methods. (If you reach the end of the range for the number of rectangles, then just type in the number of rectangles you want. You will need to click ok to enable the macros.)

Method	Number of Rectangles
Left	_____
Midpoint	_____
Right	_____

- 5) Using the demonstration for $\cos x$, find the number of rectangles needed to get within 0.01 of the exact area for each of the three methods.

Method	Number of Rectangles
Left	_____
Midpoint	_____
Right	_____

- 7) Explain in your own words what is being shown by this Riemann Sum Demonstration.

- 8) Which method seems best and why?