Math 592: Incorporating Maple into LaTeX - by: Kate Overmoyer

In the following diagram, we see the graph of the function $f(x) = 2\sin(x)$ with rectangles drawn throughout. This demonstrates the idea of finding the integral on our function using area. For example, suppose we are given the problem to evaluate the following definite integral:

$$\int_{0}^{2\Pi} (2\sin(x)) \, dx$$

Now, using the following diagram,

we can see that if we calculate the area of each of the rectangles shown, we will get a fairly close approximation of the area under our curve.

Now, suppose we are discussing what multiplying $f(x) = \sin(x)$ by a constant, say $a$ will do to the curve.

On the above graph we have three curves. We can see that when $a = 2$ the curve is stretched so that our range of $f(x)$ is now $[-2,2]$ instead of $[-1,1]$. Also, when $a = (1/2)$ we see that the range of $f(x)$ has been shrunk to $[-.5,.5]$. 

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Through these two very well thought out examples, I have shown two ways that we can incorporate maple into Latex to help our students understand a concept that may be difficult.