Consider the function $f(x) = x^2$. We want to find a general formula for the area under this curve on the interval $[0, b]$.

1. Start by looking at finding the area under the graph of $f(x)$ on $[0, 1]$ using N rectangles, using the right endpoints as our test points. What do your endpoints look like? Use this to write the approximate area in summation notation.

2. What if we were to do this on $[0, 2]$, still using N rectangles? How does this change our formulas and our sum? What are the right endpoints here?

3. What if I wanted to do the same thing on $[0, b]$ for some positive number b using N rectangles? What are my endpoints here?

4. With this last sum, expand things out and use the power sum rules to get this to an expression only depending on N.

5. Take the limit as $N \to \infty$ to get the area under the graph of $f(x)$ over $[0, b]$.