Part I (due at the beginning of class Tuesday, November 25)

Read Section 5.1 from *OpenStax Calculus* on using Riemann sums to approximate area. Try Checkpoints 5.2, 5.3, and 5.4 and we'll discuss them in class. Also bring questions you have from the reading so we can clarify them together.

Part II: Problems (due at the beginning of class Tuesday, December 2)

1. The Mean Value Theorem tells us that if a function $f(x)$ is continuous on a closed interval $[a, b]$ and differentiable on an open interval (a, b), then there is a point c in (a, b) such that $f'(c) = \dfrac{f(b) - f(a)}{b - a}$. This means that there's a point in the interval where the slope of the tangent line is equal to the slope of the secant line that connects the two points $(a, f(a))$ and $(b, f(b))$. In other words, there's a point in the interval where the tangent line is parallel to the secant line.

   Suppose that $f(0) = 1$ and $f'(x) \leq 2$ for every value of x. Use the Mean Value Theorem to determine the largest possible value for $f(4)$. Make sure to explain *why* the Mean Value Theorem applies (why $f(x)$ satisfies the hypotheses of the MVT, i.e., why $f(x)$ is continuous on the closed interval in question and differentiable on the open interval in question).

2. Problem 52 on the Derivatives handout.