1. **The Fundamental Theorem of Calculus, v1:** Let f be continuous on an open interval I containing a. Then

   (a) the function A_f defined by

   $$A_f(x) = \int_a^x f(t)\, dt$$

   is defined for all $x \in I$,

   (b) $\dfrac{d}{dx}(A_f(x)) = f(x)$,
   that is, A_f is an antiderivative of f.

2. **The Fundamental Theorem of Calculus, v2:** Let f be continuous on $[a, b]$, and let F be **any** antiderivative of f. Then

   $$\int_a^b f(x)\, dx = F(b) - F(a)$$