Calculus 5.4 Key Points

Fundamental Theorem of Calculus with Chain Rule:

If we take the derivative of an integral where our bounds include a function, we can apply the chain rule when integrating:

$$\frac{d}{dx}\int_{a}^{g(x)} f(t)dt = f(g(x)) \bullet g'(x)$$

Review of FTC:

$$\int_{a}^{b} f(x)dx = F(b) - F(a) \quad \text{and} \quad \frac{d}{dx}\int_{a}^{x} f(t)dt = f(x)$$

Here's how we evaluating an integral using the FTC and chain rule:

$$\frac{d}{dx}\int_{a}^{g(x)} f(t)dt = \frac{d}{dx}(F(g(x) - F(a)) = \frac{d}{dx}(F(g(x)) = f(g(x)) \bullet g'(x)$$