Calculus 4.2 Key Points

Definite and Indefinite Integrals:

Definite: $\int_a^x f(x)dx = F(x)$

- Definite Integrals are bounded to a region

Indefinite: $\int f(x)dx = F(x) + C$

- Indefinite Integrals do not have bounds and represent all of the possible antiderivatives of $f(x)$, with C representing any constant

Fundamental Theorem of Calculus:

Part 1: $\frac{d}{dx}\int_a^x f(x)dx = f(x)$

- The derivative of the integral of a function is the function

Part 2: $\int_a^b f(x)dx = F(b) - F(a)$

- The integral of $f(x)$ from a to b can be found by taking the antiderivative of $f(x)$, which is $F(x)$; plugging in a and b into $F(x)$; and subtracting $F(a)$ from $F(b)$