0.1 Fundamental Theorem of Calculus

0.1.1 Mean value theorem for integration

Take function $f(x)$. From the extreme value theorem we know that:

$\exists m \in \mathbb{R} \exists M \in \mathbb{R} \forall x \in [a, b](m < f(x) < M)$

0.1.2 Fundamental theorem of calculus

From continuation we know that:

$\int_a^{x_1} f(x)dx + \int_{x_1}^{x_1+\delta x} f(x)dx = \int_a^{x_1+\delta x} f(x)dx$

$\int_x^{x_1+\delta x} f(x)dx = \int_a^{x_1+\delta} f(x)dx - \int_a^{x_1} f(x)dx$

Indefinite integrals