Theorems Cheatsheet

1 Fundamental Theorem of Calculus

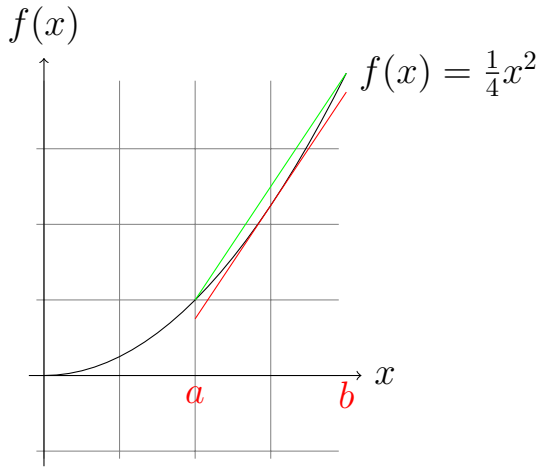
Part 1:

$$F(x) = \int_a^x f(t)dt$$
$$F'(x) = f(x)$$

Part 2:

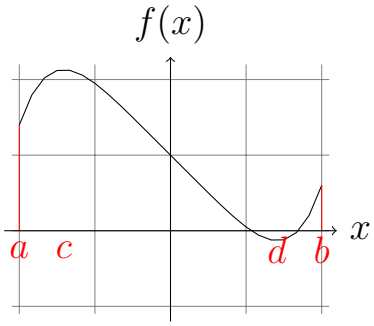
$$\int_a^b f'(x)dx = f(b) - f(a)$$

2 Mean Value Theorem



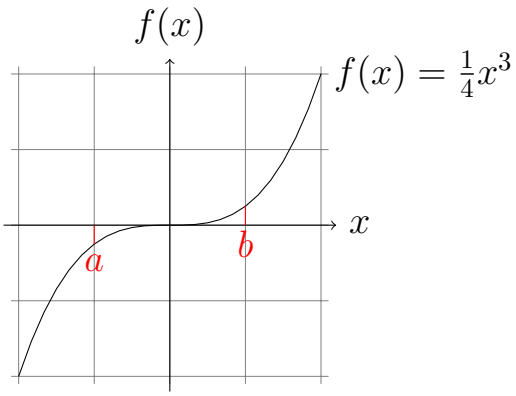
If a function f is differentiable for $x \in (a, b)$ then there will be a point x_0 such that $f(x_0) = \frac{f(b)-f(a)}{b-a}$, meaning that the instantaneous slope at some point will be the average slope of the bounds.

3 Extreme Value Theorem



If a function f is continuous for $x \in [a, b]$ then there exists a maximum and minimum c and d, respectively. $f(c) \leq f(x) \leq f(d)$ **exists.**

4 Intermediate Value Theorem



If f is continuous, then there exists a x for $f(a) \leq f(x) \leq f(b)$.