Section 5.7

I. Mean Value Theorem for Derivatives

A. Theorem

Let $f$ be continuous on $[a,b]$ and differentiable on $(a,b)$. Then, there exists a number $c \in (a,b)$ such that \[
\frac{f(b) - f(a)}{b-a} = f'(c).
\]

II. Mean Value Theorem for Integrals

A. Theorem

Let $f$ be continuous on $[a,b]$. Then, there exists a number $c \in (a,b)$ such that 
\[
\frac{1}{b-a} \int_a^b f(x) \, dx = f(c).
\]

B. Geometric Interpretation

C. Average Value Interpretation