

5.3 Mean Value Theorems

In this section we cover some very important properties of differentiable functions which will be used as tools to prove many nice results. We start with Rolle's⁶ theorem.

THEOREM 5.3.1. (*Rolle's Theorem*) Suppose the following three conditions are true for a function f :

- (a) f is continuous on $[a, b]$;
- (b) f is differentiable on (a, b) ; and
- (c) $f(a) = f(b)$.

Then there exists some point $c \in (a, b)$ such that $f'(c) = 0$.

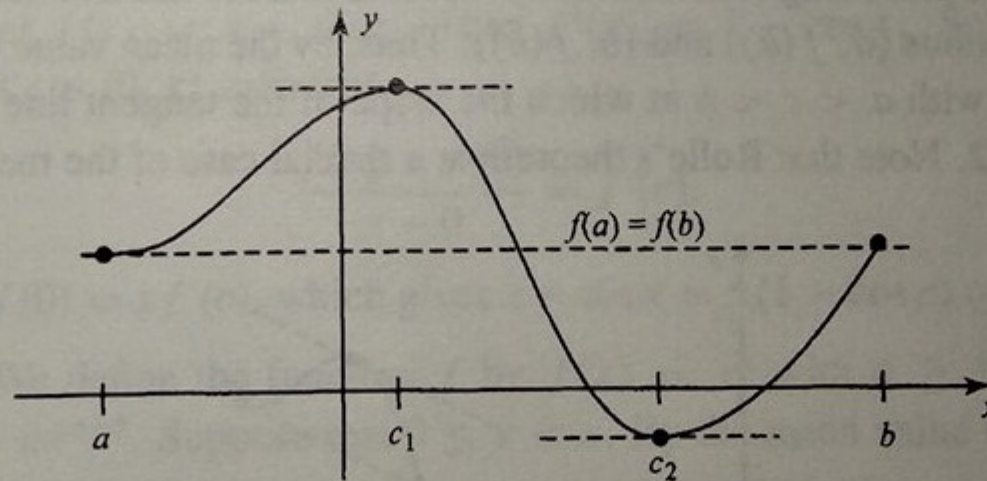


Figure 5.3.1