

The following result is also a direct application of the mean value theorem, and will be referred to again and again. Even though this next corollary seems obvious, it nevertheless requires a proof. See Exercise 5.

COROLLARY 5.3.7.

- (a) *If the function f is continuous on $[a, b]$, differentiable on (a, b) , and $f'(x) = 0$ on (a, b) , then f must be a constant function on $[a, b]$.*
- (b) *If functions f and g are continuous on $[a, b]$, differentiable on (a, b) , and $f'(x) = g'(x)$ on (a, b) , then there exists a real number k such that $f(x) = g(x) + k$ for all $x \in [a, b]$.*