Mean Value & Rolle's Theorem

If the function $f(x)$ is continuous on $[a, b]$ and the first derivative exists on the interval (a, b), then there exists a number x = c on (a, b) such that $f'(c) = \dfrac{f(b) - f(a)}{b - a}$

if f(a) = f(b), then f '(c) = 0.

Mean Value Theorem

If the function $f(x)$ is continuous on $[a, b]$, AND the first derivative exists on the interval (a, b), then there is at least one number $x = c$ in (a, b) such that

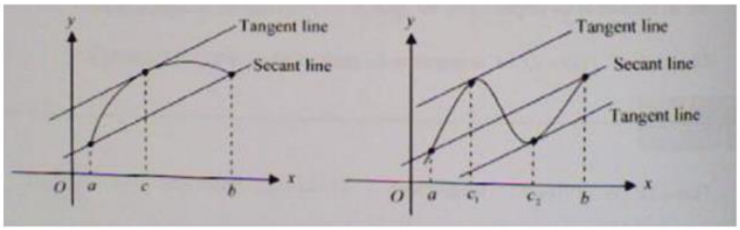
$$f'(c) = \frac{f(b) - f(a)}{b - a}.$$

* Rolle's Theorem: f '(c) = 0.

Mean Value Theorem for Derivatives

If the function *f* is continuous on the close interval [a, b] and differentiable on the open interval (a, b), then there exists at least one number *c* between *a* and *b* such that

$f'(c) = \frac{f(b)-f(a)}{b-a}$ The slope of the tangent line is equal to the slope of the secant line.



Mean Value Theorem:

If f is continuous on $[a, b]$ and differentiable on (a, b), then there exists a number c on (a, b) such that $f'(c) = \frac{f(b) - f(a)}{b - a}$.

Note : Rolle's Theorem is a special case of The Mean Value Theorem

If $f(a) = f(b)$ then $f'(c) = \frac{f(a)-f(b)}{b-a} = \frac{f(a)-f(a)}{b-a} = 0.$