

Mean Value Theorem

Solutions should show all of your work, not just a single final answer.

- Here are two theorems about continuous functions. Draw a picture that illustrates each theorem, using the notation of the theorem in your picture.
 - Rolle's Theorem:** If $f(x)$ is a continuous function on $[a, b]$ that is differentiable on (a, b) , and $f(a) = f(b)$, there is a $c \in (a, b)$ such that $f'(c) = 0$.
 - Mean Value Theorem:** If $f(x)$ is a continuous function on $[a, b]$ that is differentiable on (a, b) , there is a $c \in (a, b)$ such that $f'(c) = \frac{f(b) - f(a)}{b - a}$.
- Find every number c that satisfies the conclusion of the Mean Value Theorem for the function $f(x) = x^3 - 2x^2 + 3x$ on the interval $[0, 1]$.
- T/F (with justification) The function $1 - \frac{1}{x^4}$ satisfies the hypotheses of Rolle's Theorem on $[-1, 1]$