

Mean Value Theorem

1. If the derivative of a function is identically zero on a set in \mathbb{R} , what can you conclude?

Proof?

2. If the derivative of a function is identically zero on the interval $0 \leq x \leq 1$, what can you conclude? Proof?

3. Mean value theorem.

How do you prove that?

4. Rolle's Theorem.

How do you prove that?

5. f has a local max or min at an interior point and at such a point its derivative is zero.

How do you prove that?

6. a) If f is continuous on a closed and bounded interval $[a, b]$ it is bounded and

b) There are points $c_{\pm} \in [a, b]$ where $f(c_{\pm})$ equals its sup and inf.

How do you prove these?

7. Bolzano-Weiertrass

How do you prove this?

8. Repeatedly bisect and use the left-most interval that has infinitely many points.

9. How do you prove this?

Completeness of the reals: if you have a bounded monotone increasing sequence of real numbers, a_j , then there is some real number A to which it converges: $a_j \rightarrow A$.

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