

Name: _____

Rolle's Theorem and Mean Value Theorem

1) Verify Rolle's Theorem

1. $f(x) = x^4 - 4x^2$ on $[-2, 2]$

2. $f(x) = x^3 - 9x$ on $[-3, 3]$

2) Verify the Mean Value Theorem

1. $f(x) = x^4$ on $[0, 2]$

2. $f(x) = x^3 - 3x^2$ on $[-1, 3]$

3) Find the value or values of c that satisfy the equation $\frac{f(b) - f(a)}{b - a} = f'(c)$ in the conclusion of the Mean Value Theorem for the following functions and intervals.

1) $f(x) = x^2 - 3x + 2$, $[0, 1]$

2) $f(x) = \sqrt{x-1}$, $[1, 3]$

4) If c is the value defined by Rolle's Theorem, then, for $f(x) = x \sin(x)$ on $[0, \pi]$, find c .5) How many values of c (as defined by Rolle's Theorem) exists for $f(x) = 2 \sin x + \sin 4x$ on the interval $[0, \pi]$?