

Math 1210 #20

Mean Value Theorem for Derivatives

Mean Value Theorem for Derivatives

If f is continuous on $[a, b]$ and differentiable on (a, b) , then there exists at least one c on (a, b) such that

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

EX 1

Find the number c guaranteed by the MVT for derivatives for

$$g(x) = (x + 1)^3 \text{ on } [-1, 1]$$

EX 2

For $g(x) = \frac{x-4}{x-3}$, decide if we can use the MVT for derivatives on $[0,5]$ or $[4,6]$. If so, find c . If not, explain why.

EX 3

For $f(x) = \csc x$ on $[-\pi/2, \pi/2]$, use the MVT for derivatives to find c .

Theorem B

If $f'(x) = g'(x)$ for all x on the interval (a, b) , then there exists a real number, c , such that $f(x) = g(x) + c$ for all x in the interval (a, b) .

