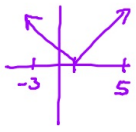


Warm-Up After MVT

Determine if the MVT applies to the given interval if not, explain why if so, find the value of "c" that satisfies the MVT without a calculator.

1. $f(x) = |x-1|$ on $[-3, 5]$ $f'(x) = \begin{cases} -1 & x < 1 \\ 1 & x > 1 \end{cases}$



MVT does not apply
b/c $f(x)$ is not diff.
∴ $c = 1$

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

$$\frac{|1-1| - |-3-1|}{1 - (-3)} = -1$$

$$\frac{-4}{4} = -1 \quad \text{all } c \text{ values on the interval } [-3, 1)$$

$$-1 = -1$$

3. $f(x) = x^2$ on $(0, 2]$

MVT d.n. apply on a open interval

4. $f(x) = \ln(x+3)$ on $[-2, 2]$



$$\frac{\ln(2+3) - \ln(-2+3)}{2 - (-2)} = \frac{1}{c+3}$$

$$\frac{\ln(5)}{4} = \frac{1}{c+3}$$

$$c+3 = \frac{4}{\ln(5)}$$

$$c = \frac{4}{\ln(5)} - 3$$

5. $f(x) = x^{\frac{2}{3}}$ on $[-2, 2]$

$$f'(c) = \frac{2}{3} c^{-\frac{1}{3}} = \frac{2}{3c^{\frac{1}{3}}}$$

MVT d.n. apply f' is not diff.
∴ $c = 0$