微積分作業4

October 3, 2025

1 find dy/dx by implicit differentiation.

$$x = sec(\frac{1}{y})$$

2 find the absolute extrema of the function (if any exist) on each interval.

$$y = tan(\frac{x\pi}{8}),\ [0, 2]$$

3 Determine whether Rolle's Theorem can be applied to f on the closed interval $[a, b]$. If Rolle's Theorem can be applied, find all values of c in the open interval (a, b) such that $f'(c) = 0$. If Rolle's Theorem cannot be applied, explain why not.

$$f(x) = 3 - |x - 3|,\ [0, 6]$$

4 Problem: Determine whether the Mean Value Theorem can be applied to f on the closed interval $[a, b]$. If the Mean Value Theorem can be applied, find all values of c in the open interval (a, b) such that

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

If the Mean Value Theorem cannot be applied, explain why not.

$$f(x) = x^3 - 3x^2 + 9x + 5, \quad [0, 1]$$