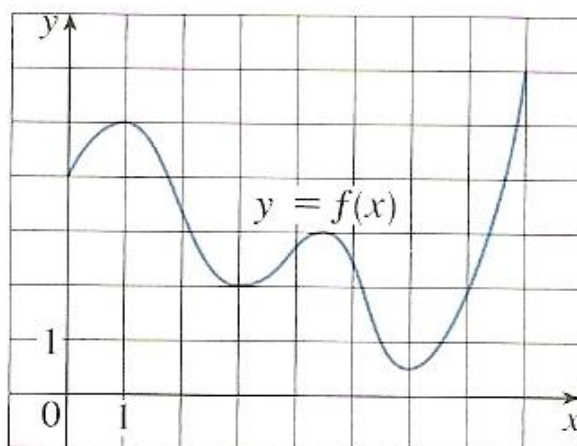


Name: _____

Rolle's Theorem and Mean Value Theorem

Exercise 1: Use the graph of f to estimate the values of c that satisfy the conclusion of the Mean Value Theorem for the interval $[0,8]$.



Exercise 2: Verify that the function satisfies the hypotheses of the Mean Value Theorem on the given interval. Then find all numbers c that satisfy the conclusion of the Mean Value Theorem.

- 1) $f(x) = 3x^2 + 2x + 5$, $[-1, 1]$
- 2) $f(x) = \sqrt[3]{x}$, $[0, 1]$
- 3) $f(x) = \frac{x}{x+2}$, $[1, 4]$

Exercise 3: Find the points (the c value) on the curve $f(x) = \frac{1}{x+1}$ where the Mean Value Theorem is satisfied over the interval $[1, 3]$, i.e. find the c -values that satisfy $f'(c) = \frac{f(b) - f(a)}{b - a}$ in the Mean Value Theorem.

Exercise 4: Use the Mean Value Theorem. show that: $(a > b)$

- 1) $|\sin a - \sin b| \leq |a - b|$
- 2) $\left| \frac{\cos ax - \cos bx}{x} \right| \leq |a - b|, x \neq 0$
- 3) $\left| \frac{\sin px}{x} \right| \leq p, p > 0, x > 0.$