

Rolle's Theorem and MVT

HW 3-3

For each problem, determine if Rolle's Theorem applies by checking all three conditions. If it does, find the values of c that satisfy the theorem.

1) $y = x^2 + 4x + 5; [-3, -1]$

2) $y = \frac{-x^2 - 2x + 15}{-x + 4}; [-5, 3]$

3) $y = x^3 - 4x^2 - x + 7; [-1, 4]$

4) $y = \frac{x^2 - 2x - 15}{-x + 6}; [-3, 5]$

5) $y = \frac{-x^2 + 4}{4x}; [-2, 2]$

6) $y = -2\cos(2x); [0, 2\pi]$

For each problem, determine if the Mean Value Theorem applies by checking both conditions. Then, find all values of c that satisfy the MVT.

7) $y = x^2 + 8x - 17$; $[3, 6]$

8) $y = -\frac{x^2}{2} + x^{-\frac{1}{2}}$; $[-2, 1]$

9) $y = \frac{-x^2}{4x+8}$; $[-3, -1]$

10) $y = \frac{x^2-9}{3x}$; $[1, 4]$

11) $y = -(-5x+25)^{1/2}$; $[3, 5]$

12) $y = (x-3)^{2/3}$; $[1, 4]$

13) Explain briefly how Rolle's Theorem is different from the Mean Value Theorem.