

SECTION PROBLEMS (odd)

Section 3.2 11-23, 39-47 Section 3.3 Problems 17-25

Section 3.4 Problems 19-25, 37-45 Section 3.5 Problems 23-29

1. Find all numbers c that satisfy the conclusion of Rolle's Theorem for the given functions on the given intervals.

(a) $f(x) = x^2 - 4x + 1$ and $[0, 4]$

(b) $f(x) = x^3 - 3x^2 + 2x + 5$ and $[0, 2]$

(c) $f(x) = 9x^2 - x^4$ and $[-3, 3]$

2. Find all numbers c that satisfy the conclusion of the Mean Value Theorem for the given functions on the given intervals.

(a) $f(x) = 3x^2 + 2x + 5$ and $[-1, 1]$

(b) $f(x) = x^3 + x - 1$ and $[0, 1]$

(c) $f(x) = 3x^2 + 6x - 5$ and $[-2, 1]$

3. Find:

- (i) intervals of increase or decrease
- (ii) relative maximum or minimum values
- (iii) intervals of concavity
- (iv) points of inflection and
- (v) sketch the curve.

(a) $y = x^3 + x$

(b) $y = x^3 - 3x$

(c) $y = x^5 + 4x^3$

(d) $y = x^5 - 5x^4$

(e) $y = 4x^3 - x^4$

(f) $y = x^{\frac{1}{5}}$

(g) $y = x^{\frac{2}{5}}$

(h) $y = x^{\frac{3}{7}}$

(i) $y = x^{\frac{4}{7}}$