

Rolle's Theorem and Mean Value Theorem

Rolle's Theorem –

Mean Value Theorem – MVT

Functions with the same derivatives differ by a constant

If $f' > 0$

If $f' < 0$

If $f(c_1) < 0$ and $f(c_2) > 0$

Ex.) $f(x) = x^{2/3}$ $[0,1]$

Ex.) $f(x) = x^3 + \frac{7}{x^2} + 7 \quad (-\infty, 0)$

Ex.)

a.) $y' = 2x$

b.) $y' = 2x - 1$

c.) $y' = 3x^2 + 2x - 1$

Ex.) $V = \frac{2}{\pi} \cos\left(\frac{2t}{\pi}\right) \quad s(\pi^2) = 1$

Ex.) $r'(t) = \sec t \tan t - 1 \quad P(0, 0)$

Try It: $g'(x) = \frac{1}{x^2} + 2x, \quad P(-1, 1)$