

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

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

Ex.)

$$\text{a.) } y' = 2x$$

$$\text{b.) } y' = 2x - 1$$

$$\text{c.) } y' = 3x^2 + 2x - 1$$

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

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