### 4.0 Existence Theorems

(1) The Intermediate Value Theorem -
(2) The Extreme Value Theorem -
(3) The Mean Value Theorem -


At what $x$-value(s) on the interval $[-2,3]$ does the graph of $f(x)=x^{2}+2 x-1$ satisfy the Mean Value Theorem?

Given the function $g(x)=\frac{1}{x}$, find the $x$-value that satisfies the Mean Value Theorem on the interval $\left[\frac{1}{4}, 1\right]$
(4) Rolle's Theorem -


Find the $x$-intercepts of $f(x)=x^{2}-3 x+2$ and show that $f^{\prime}(x)=0$ at some point between the two intercepts.

