

Problem 1

Show that $f(x) = x^5 + x + 3$ has one, and only one zero.

Problem 2

Let $f(x) = x^5 + 2x^2 + 3$. Use the Mean Value Theorem to show that there is a c in $(-1, 1)$ such that $f'(c) = 1$.

Problem 3

Determine the intervals of increase and decrease for the function $f(x) = x^2 + 2x + 1$.

Problem 4

Determine the intervals of increase and decrease for the function $f(x) = \frac{1}{3}x^3 - x$.