## Calculus in Higher Dimensions

Background

This topic deals with extending concepts such as limits, continuity, differentiation, and integration, studied in first year calculus, to functions of several variables. Topics covered:

- Continuity of functions of several variables.

- Limits, partial derivatives, gradients, directional derivatives, divergence, and curl and apply these concepts to problem solving.

- Nature of extrema and optimization problems using Lagrange multipliers.

- Determine double and triple integrals and use them to calculate areas and volumes.

- Determine line, surface and flux integrals and apply the theorems of Green, Stokes and Gauss, which relate these types of integrals.