MATH 2415: Calculus 3
Timothy Lo, Dallas College, Fall 2024

1 Vectors and the Geometry of Space

1.1 Vectors in the Plane

1.2 Vectors in Three Dimensions

1.3 Dot Products

1.4 Cross Products

1.5 Lines and Planes in Space

1.6 Cylinders and Quadric Surfaces

2 Vector-Valued Functions

3 Functions of Several Variables

3.1 Graphs and Level Curves

3.2 Limits and Continuity

3.3 Partial Derivatives

3.4 The Chain Rule

3.5 Directional Derivatives and the Gradient

3.6 Tangent Planes and Linear Approximation

3.7 Maximum/Minimum Problems

3.8 Lagrange Multipliers

4 Multiple Integration

4.1 Double Integrals over Rectangular Regions

4.2 Double Integrals over General Regions

4.3 Double Integrals in Polar Coordinates

4.4 Triple Integrals

4.5 Triple Integrals in Cylindrical and Spherical Coordinates

4.6 Integrals for Mass Calculations

4.7 Change of Variables in Multiple Integrals

5 Vector Calculus

5.1 Vector Fields

5.2 Line Integrals

5.3 Conservative Vector Fields

5.4 Green's Theorem

5.5 Divergence and Curl

5.6 Surface Integrals

5.7 Stokes' Theorem

5.8 Divergence Theorem