FIRST YEAR CALCULUS: TOPICS TO BE COVERED

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A. DIFFERENTIATION

A1. Standard Forms

A2. Derviatives from first principles

A3. Useful rules

A4. Chain rule

A5. Changing variables in differential equations

A6. Implicit differentiation

A7. Powers and inverse functions

A8. Parametric differentiation

A9. Leibnitz theorem

B. INTEGRATION

B1. Standard forms

B2. Integration by inspection

B3. Integration by change of variable

B4. Integration by partial fractions

B5. Integration by parts

B6. Integration by reduction forumulae

B7. Interpretation of an integral

B8. Properties of definite integrals

B9. Applications of integration

B10. Line integrals

C. SERIES AND LIMITS

C1. Introduction and Notation

C2. Taylor and Maclaurin Series

(a) Taylor series

(b) Maclaurin series

(c) Common series expansions

(d) Manipulation of Series

C3. Limits

(a) definition of a limit

(b) continuous, discontinuous and differentiable functions

(c) finding limits

D. CALCULUS OF FUNCTIONS OF MORE THAN ONE VARIABLE

D1. Co-ordinate systems

D2. Graphical representation

D3. Partial derivatives: introduction and notation

(a) definition and notation

(b) higher order derivatives $\partial_{xy} f = \partial_{yx} f$

(c) geometrical interpretation

(d) Taylor expansion

D4. Total derivatives

(a) total differential

(b) small changes

(c) chain rule

(d) implicit differentiation

D5. Changing variables

D6. Exact derivatives

D7. Maxima, minima and saddle points