NPTEL Video Course - Mathematics - NOC:Basic Calculus 1 and 2

Subject Co-ordinator - Prof. Parasar Mohanty

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Real numbers and Archimedean property
Lecture 2 - Supremum and Decimal representation of Reals
Lecture 3 - Functions
Lecture 4 - Functions continued and Limits
Lecture 5 - Limits (Continued...)
Lecture 6 - Limits (Continued...) and Continuity
Lecture 7 - Continuity and Intermediate Value Property
Lecture 8 - Differentiation
Lecture 9 - Chain Rule
Lecture 10 - Nth derivative of a function
Lecture 11 - Local extrema and Rolle's theorem
Lecture 12 - Mean value theorem and Monotone functions
Lecture 13 - Local extremum tests
Lecture 14 - Concavity and points of inflection
Lecture 15 - Asymptotes and plotting graph of functions
Lecture 16 - Optimization and L'Hospital Rule
Lecture 17 - L'Hospital Rule continued and Cauchy Mean value theorem
Lecture 18 - Approximation of Roots
Lecture 19 - Antiderivative and Riemann Integration
Lecture 20 - Riemann's criterion for Integrability
Lecture 21 - Integration and its properties
Lecture 22 - Area and Mean value theorem for integrals
Lecture 23 - Fundamental theorem of Calculus
Lecture 24 - Integration by parts and Trapezoidal rule
Lecture 25 - Simpson's rule and Substitution in integrals
Lecture 26 - Area between curves
Lecture 27 - Arc Length and Parametric curves
Lecture 28 - Polar Co-ordinates
Lecture 29 - Area of curves in polar coordinates

Lecture 30 - Volume of solids
Lecture 31 - Improper Integrals
Lecture 32 - Sequences
Lecture 33 - Algebra of sequences and Sandwich theorem
Lecture 34 - Subsequences
Lecture 35 - Series
Lecture 36 - Comparison tests for Series
Lecture 37 - Ratio and Root test for series
Lecture 38 - Integral test and Leibniz test for series
Lecture 39 - Revision - I
Lecture 40 - Revision - II