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| * Prerequisites
	+ Common Functions
	+ The Number Systems
		- Naturals
		- Integers
		- Rationals
* Real Numbers, Infinite Sequences, Functions
	+ The axioms of the real numbers, including
		- the field axioms,
		- the order axioms, and
		- the completeness axiom.
* Limits of Functions
	+ Definition of the limit of a function
	+ Examples of some limits of functions using
		- Algebra
		- Graphs
		- tables
	+ One-sided Limits
	+ Limits at infinity
	+ Applications:
		- Asymptotic behavior of functions
		- relative rates of change
		- relative magnitudes
	+ Continuity of a function
		- limit definition and
		- some examples of families of continuous functions
	+ Intermediate Value Theorem
	+ Extreme Value Theorem
* Derivatives
	+ Definition of the derivative
		- difference quotient
		- Properties of the derivative operation: product rule, quotient rule, chain rule
	+ Interpretation of the derivative
		- graphical,
		- numerical, and
		- analytic and as
		- the instantaneous rate of change
	+ Differentiability and continuity
	+ Derivatives at points:
		- slope of curve at a point
		- non-existence
		- vertical tangents
		- Linear approximation of curve by derivative at a point
		- approximations of derivative at a point
	+ Derivative as a function
		- the corresponding characteristics between f and its derivative, namely increasing, decreasing behavior;
		- mean-value theorem for derivatives and geometric interpretation;
		- examples of equations in which derivatives show up (some famous differential equations);
		- Derivatives of common functions
	+ Second Derivatives
		- Corresponding characteristics between f, f’, and f’’
		- concavity and points of inflection
	+ Applications
		- Analysis of curves – monotonicity, concavity
		- Analysis of planar curves given in parametric, polar, and vector form, notably velocity and acceleration
		- Optimization: critical points, extreme value theorem revisited, rolle’s theorem, relative (local) and absolute (global) extrema
		- Modeling rates of change and related rates problems
		- Implicit differentiation and derivative of inverse function
		- Differential equations: slope fields, relationships between solution curves and the slope fields, Euler’s method
		- L’Hospital’s Rule, application to limits
* Integration
	+ Definition and Properties
		- Definition by Riemann sums
		- Definition by Darboux sums
	+ Properties of the integral, including additivity, linearity, by-parts, u-substitution, etc
	+ Numerical Approximation to Definite integrals
		- Use of Riemann Sums
		- Left, right, midpoint, trapezoidal approximations
	+ Fundamental Theorems of Calculus
		- Use to evaluate definite integrals
		- Antidifferentiation
	+ Techniques of Antidifferentiation and Integration
		- Directly from derivatives of basic functions
		- U-substitution
		- By-parts (including repeated by-parts)
		- Partial fractions
		- Trigonometric substitution
	+ Improper Integrals
		- Gabriel’s Horn
	+ Arc Length
	+ Volumes of Rotation and by Cross-Section
	+ Area Between Curves
	+ More Differential Equations
		- Separable Differential Equations
		- Logistic Differentiation Equations
		- First-order Linear differential equations
* Polar and Parametric Equations
	+ Definition of Parametric Equations
	+ Differentiation of Parametric Equations
	+ Integration of Parametric Equations
	+ Converting from Parametric to Rectangular
	+ Definition of Polar Equations
	+ Differentiation of Polar Equations
	+ Integration of Polar Functions
	+ Converting from Polar to Rectangular
	+ Arc Length in Polar and parametric
* Polynomial Approximations and Infinite Series
	+ Reminder of infinite sequences
		- Main theorems (Cauchy, Monotone Convergence, etc)
	+ Some important results with finite sums
		- Geometric sum
		- Summation By-parts
	+ Definition of Infinite series and Tests of Convergence/ Divergence
		- Motivations (infinite decimals)
		- Definition as limit of partial sums
		- Cauchy Criterion
		- N-th term test
		- Geometric Series Test, nudge to Power Series
		- Cauchy Condensation Test
		- P-series test and the harmonic series
		- Direct and limit comparison tests
		- Ratio and root tests, nudge to Taylor Series
		- Alternating series tests
		- Integral Test
	+ Taylor Series
		- Taylor Polynomial Approximations and Taylor’s Theorem (Lagrange Error bound)
		- Definition of Maclaurin and Taylor series for general functions
		- Maclaurin and Taylor series for common functions
		- Manipulation of Taylor Series; integration, differentiation, substitution, etc
		- Functions and Power series representations
		- Radius and Interval of Convergence of Power series, Taylor Series (attention paid to end-points)
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