

Comparison of Math Analysis, AP Calculus AB, and AP Calculus BC Topics

Topic	Math Analysis	AP Calculus AB	AP Calculus BC
Finding Limits Graphically, Numerically, Analytically	X	X	X
Continuity and One-sided limits, Infinite limits, limits at infinity	X	X	X
The Derivative and Tangent Line Problem	X	X	X
Differentiation Rules and Rates of Change	X	X	X
Product rule, quotient rule, chain rule	X	X	X
Implicit differentiation	X	X	X
Related rates	X	X	X
Extrema on an interval, Rolle's Theorem, Mean Value Theorem	X	X	X
First derivative test, second derivative test	X	X	X
Curve sketching	X	X	X
Optimization problems	X	X	X
Newton's Method			X
Differentials			X
Antiderivatives, Indefinite integration, Area		X	X
Riemann Sums, Definite Integrals		X	X
The Fundamental Theorem of Calculus (I and II)		X	X
Mean Value Theorem for Integrals		X	X
Average Value over a closed interval		X	X
Integration by Substitution		X	X
Numerical Integration: the Trapezoidal Rule, Simpson's Rule, error analysis		X	X
The Natural Log Function: Differentiation, Integration		X	X
Integrals for six basic trig functions		X	X
Derivatives of Inverse Functions		X	X
Exponential Functions: Differentiation, Integration		X	X
Differentiation and Integration of exponential functions for bases other than e		X	X
Inverse Trig Functions: Differentiation, Integration		X	X

Topics	Math Analysis	AP Calculus AB	AP Calculus BC
Slope fields: sketching, using initial conditions to find particular solutions		X	X
Slope fields: approximating solutions to differential equations		X	X
Euler's Method			X
Solve differential equations using separation of variables		X	X
Use differential equations to model, solve, and analyze applied problems			X
Finding the area of a region between two curves using integration		X	X
Finding the area of a region between intersecting curves using integration		X	X
Find the volume of a solid of revolution using the disk method and washer method		X	X
Find the volume of a solid with a known cross section		X	X
Find the volume of a solid of revolution using the shell method		X	X
Find the arc length of a smooth curve			X
Find the area of a surface of revolution		X	X
Find an antiderivative using integration by parts, including using the tabular method			X
Solve trigonometric integrals			X
Use trigonometric substitution to solve an integral			X
Find antiderivatives using partial fraction decomposition			X
Recognize limits that produce indeterminate forms (*Fall 2016)		*X	X
Apply L'Hôpital's Rule to evaluate limits (*Fall 2016)		*X	X
Evaluate Improper Integrals			X
Sequences and Series: recognize specific series, apply various tests to determine the convergence or divergence of a series (Alternating Series Test, Limit Comparison Test FA2016)			X
Calculate the Alternate Series Error Bound (*Fall 2016)			*X
Find Taylor and Maclaurin polynomial approximations for elementary functions			X
Calculate the Lagrange Error Bound for Taylor Polynomials			X
Power Series: Find the radius and interval of convergence, determine endpoints of convergence, differentiate and integrate			X
Find the area of a surface of revolution in parametric form or polar form			X
Find arc length of a curve given by a set of parametric equations or a polar graph			X
Find the slope of a tangent line to a curve given by a set of parametric equations			X
Find the area of a region bounded by polar curves			X
Find the points of intersection of two polar graphs			X
Find derivatives for parametric, polar, and vector functions			X