Correlation from *Calculus of a Single Variable* to the College Board AP® Calculus AB and BC Framework

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Lesson		Topic	Learning Objective
Chapter 1: Limits and Their Properties			
1.1	A Preview of Calculus	1.1	CHA-1.A
1.2	Finding Limits Graphically and Numerically	1.2, 1.3, 1.4, 1.9	LIM-1.A, LIM-1.B, LIM-1.C
1.3	Evaluating Limits Analytically	1.2, 1.5, 1.6, 1.7, 1.8, 1.9	LIM-1.B, LIM-1.D, LIM-1.E
1.4	Continuity and One-Sided Limits	1.3, 1.5, 1.10, 1.11, 1.12, 1.13, 1.16	LIM-1.C, LIM-1.D, LIM-2.A, LIM-2.B, LIM-2.C, FUN-1.A
1.5	Infinite Limits	1.9, 1.10, 1.14	LIM-2.A, LIM-2.D
Chapter 2: Differentiation			
2.1	The Derivative and the Tangent Line Problem	1.1, 2.1, 2.2, 2.3, 2.4, 4.1	CHA-1.A, CHA-2.A, CHA-2.B, CHA-2.C, CHA-2.D, CHA-3.A, FUN-2.A
2.2	Basic Differentiation Rules and Rates of Change	1.1, 2.1, 2.5, 2.6, 2.7, 4.1, 4.2	CHA-1.A, CHA-2.A, CHA-2.B, CHA-3.A, CHA-3.B, LIM-3A, FUN-3.A
2.3	Product and Quotient Rules and Higher-Order Derivatives	2.8, 2.9, 2.10, 3.5, 3.6, 4.2	FUN-3.B, FUN-3.F, CHA-3.B
2.4	The Chain Rule	2.7, 2.10, 3.1, 3.5	LIM-3A, FUN-3.A, FUN-3.B, FUN-3.C
2.5	Implicit Differentiation	3.2, 5.12	FUN-3.D, FUN-4.E
2.6	Related Rates	4.2, 4.3, 4.4, 4.5	CHA-3.B, CHA-3.C, CHA-3.D, CHA-3.E
Chapter 3: Applications of Differentiation			
3.1	Extrema on an Interval	5.2, 5.5, 5.12	FUN-1.C, FUN-4.A, FUN-4.D
3.2	Rolle's Theorem and the Mean Value Theorem	5.1	FUN-1.B
3.3	Increasing and Decreasing Functions and the First Derivative Test	5.3, 5.4	FUN-4.A
3.4	Concavity and the Second Derivative Test	5.6, 5.7	FUN-4.A
3.5	Limits at Infinity	1.9, 1.15	LIM-1.E, LIM-2.D
3.6	A Summary of Curve Sketching	5.8, 5.9	FUN-4.A
3.7	Optimization Problems	5.10, 5.11	FUN-4.B, FUN-4.C
3.8	Newton's Method		
3.9	Differentials	4.6	CHA-3.F
Chapter 4: Integration			
4.1	Antiderivatives and Indefinite Integration	6.7, 6.8, 6.14, 7.1, 7.6, 7.7, 8.2	FUN-6.B, FUN-6.C, FUN-7.A, FUN-7.D, FUN-7.E, CHA-4.C
4.2	Area	6.1	CHA-4.A
4.3	Riemann Sums and Definite Integrals	6.2, 6.3, 6.6, 6.8	LIM-5.A, LIM-5.B, LIM-5.C, FUN-6.A, FUN-6.C
4.4	The Fundamental Theorem of Calculus	6.1, 6.4, 6.5, 6.6, 6.7, 8.1, 8.2, 8.3	CHA-4.A, CHA-4.B, CHA-4.C, CHA-4.D, CHA-4.E, FUN-5.A, FUN-6.A, FUN-6.B
4.5	Integration by Substitution	6.9	FUN-6.D

Lesson		Topic	Learning Objective
Chapter 5: Logarithmic, Exponential, and Other Transcendental Functions			
5.1	The Natural Logarithmic Function: Differentiation	2.7	FUN-3.A
5.2	The Natural Logarithmic Function: Integration	6.8, 6.10	FUN-6.C, FUN-6.D
5.3	Inverse Functions	3.3	FUN-3.E
5.4	Exponential Functions: Differentiation and Integration	2.7, 6.8	FUN-3.A, FUN-6.C
5.5	Bases Other than *e* and Applications		
5.6	Indeterminate Forms and L'Hôpital's Rule	4.7	LIM-4.A
5.7	Inverse Trigonometric Functions: Differentiation	3.4	FUN-3.E
5.8	Inverse Trigonometric Functions: Integration	6.8, 6.10, 6.14	FUN-6.C, FUN-6.D
5.9	Hyperbolic Functions		
Chapter 6: Differential Equations			
6.1	Slope Fields and Euler's Method	7.1, 7.2, 7.3, 7.4, 7.5, 7.7	FUN-7.A, FUN-7.B, FUN-7.C, FUN-7.E
6.2	Growth and Decay	7.6, 7.7, 7.8	FUN-7.D, FUN-7.E, FUN-7.F, FUN-7.G
6.3	Separation of Variables and the Logistic Equation	7.6, 7.7, 7.9	FUN-7.D, FUN-7.E, FUN-7.H
6.4	First-Order Linear Differential Equations		
Chapter 7: Applications of Integration			
7.1	Area of a Region Between Two Curves	8.4, 8.5, 8.6	CHA-5.A
7.2	Volume: The Disk Method	8.7, 8.8, 8.9, 8.10, 8.11, 8.12	CHA-5.B, CHA-5.C
7.3	Volume: The Shell Method		
7.4	Arc Length and Surfaces of Revolution	8.13	CHA-6.A
7.5	Work		
7.6	Moments, Centers of Mass, and Centroids		
7.7	Fluid Pressure and Fluid Force		
Chapter 8: Integration Techniques and Improper Integrals			
8.1	Basic Integration Rules	6.9, 6.10, 6.14	FUN-6.D
8.2	Integration by Parts	6.11, 6.14	FUN-6.E
8.3	Trigonometric Integrals	6.14	
8.4	Trigonometric Substitution	6.14	
8.5	Partial Fractions	6.12, 6.14	FUN-6.F
8.6	Numerical Integration	6.2	LIM-5.A
8.7	Integration by Tables and Other Integration Techniques	6.14	
8.8	Improper Integrals	6.13	LIM-6.A

Lesson		Topic	Learning Objective
Chapter 9: Infinite Series			
9.1	Sequences		
9.2	Series and Convergence	10.1, 10.2, 10.3	LIM-7.A
9.3	The Integral Test and *p*-Series	10.4, 10.5	LIM-7.A
9.4	Comparisons of Series	10.6	LIM-7.A
9.5	Alternating Series	10.7, 10.9, 10.10	LIM-7.A, LIM-7.B
9.6	The Ratio and Root Tests	10.8	LIM-7.A
9.7	Taylor Polynomials and Approximations	10.11, 10.12	LIM-8.A, LIM-8.B, LIM-8.C
9.8	Power Series	10.13	LIM-8.D
9.9	Representation of Functions by Power Series	10.12, 10.14, 10.15	LIM-8.C, LIM-8.F, LIM-8.G
9.10	Taylor and Maclaurin Series	10.13, 10.14, 10.15	LIM-8.D, LIM-8.E, LIM-8.F, LIM-8.G
Chapter 10: Conics, Parametric Equations, and Polar Coordinates			
10.1	Conics and Calculus		
10.2	Plane Curves and Parametric Equations	9.1	
10.3	Parametric Equations and Calculus	9.1, 9.2, 9.3	CHA-3.G, CHA-6.B
10.4	Polar Coordinates and Polar Graphs	9.7	FUN-3.G
10.5	Area and Arc Length in Polar Coordinates	9.8, 9.9	CHA-5.D
10.6	Polar Equations of Conics and Kepler's Laws		
Appendix H: Vector Analysis for AP® Calculus (Online at *LarsonCalculus.com*)			
H.1	Vectors in the Plane	9.4	
H.2	Vector-Valued Functions	9.4, 9.5	CHA-3.H, FUN-8.A
H.3	Velocity and Acceleration	9.6	FUN-8.B