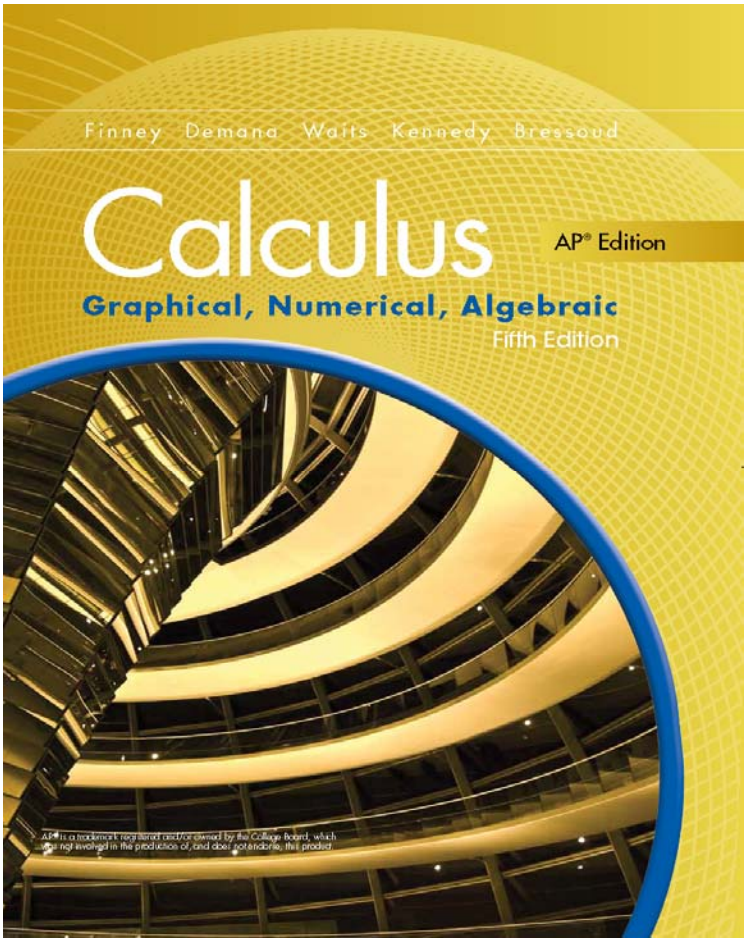
A Correlation of

Calculus

Graphical, Numerical, Algebraic
5e AP® Edition, ©2016

Finney, Demana, Waits, Kennedy, & Bressoud



to the

Florida Advanced Placement Calculus AB/BC Standards (#1202310 & #1202320)

ALWAYS LEARNING PEARSON

A Correlation of Calculus Graphical, Numerical, Algebraic AP Edition, ©2016 to the Advanced Placement Calculus AB/BC Standards

AP Calculus AB / BC Curriculum Framework	Calculus Graphical, Numerical, Algebraic, ©2016 Section References
Math Practices	
MPAC 1: Reasoning with definitions and theorems	Reasoning with definitions and theorems is one of the dominant themes in the development of each new idea and of the exercises. Definitions and theorems are highlighted in each section and summarized at the end of each chapter for reference and review.
MPAC 2: Connecting concepts	Connecting concepts runs throughout this book, introducing new concepts by connecting them to what has come before and in the reliance of many exercises that draw on applications or build on student knowledge. Quick Review exercises at the start of each Exercise set review concepts from previous sections (or previous courses) that will be needed for the solutions.
MPAC 3: Implementing algebraic/computational processes	Implementing algebraic/computational processes is well represented in the foundational exercises with which each exercise set begins and in the thoughtful use of technology.
MPAC 4: Connecting multiple representations	Connecting multiple representations has always been present in the emphasis on the connections among graphical, numerical, and algebraic representations of the key concepts of calculus. The title of this book speaks for itself in that regard.
MPAC 5: Building notational fluency	Building notational fluency is represented in the intentional use of a variety of notational forms and in their explicit connection to graphical, numerical, and algebraic representations. Many margin notes explicitly address notational concerns.
MPAC 6: Communicating	Communicating is a critical component of the Explorations that appear in each section. Communication is also essential to the Writing to Learn exercises as well as the Group Activities. Many of the exercises and examples in the book have “justify your answer” components in the spirit of the AP exams.

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Big Idea 1: Limits	
EU 1.1: The concept of a limit can be used to understand the behavior of functions.	
LO 1.1A(a): Express limits symbolically using correct notation.	**SE/TE: 2.1** Rates of Change and Limits, **2.2** Limits Involving Infinity
LO 1.1A(b): Interpret limits expressed symbolically.	**SE/TE: 2.1** Rates of Change and Limits, **2.2** Limits Involving Infinity
LO 1.1B: Estimate limits of functions.	**SE/TE: 2.1** Rates of Change and Limits, **2.2** Limits Involving Infinity
LO 1.1C: Determine limits of functions.	**SE/TE: 2.1** Rates of Change and Limits, **2.2** Limits Involving Infinity, **9.2** L'Hospital's Rule, **9.3** Relative Rates of Growth
LO 1.1D: Deduce and interpret behavior of functions using limits.	**SE/TE: 2.1** Rates of Change and Limits, **2.2** Limits Involving Infinity, **9.3** Relative Rates of Growth
EU 1.2: Continuity is a key property of functions that is defined using limits.	
LO 1.2A: Analyze functions for intervals of continuity or points of discontinuity.	**SE/TE: 2.3** Continuity
LO 1.2B: Determine the applicability of important calculus theorems using continuity.	**SE/TE: 2.3** Continuity, **5.1** Extreme Values of Functions, **5.2** Mean Value Theorem, **6.2** Definite Integrals, **6.3** Definite Integrals and Antiderivatives, **6.4** Fundamental Theorem of Calculus
Big Idea 2: Derivatives	
EU 2.1: The derivative of a function is defined as the limit of a difference quotient and can be determined using a variety of strategies.	
LO 2.1A: Identify the derivative of a function as the limit of a difference quotient.	**SE/TE: 3.1** Derivative of a Function
LO 2.1B: Estimate the derivative.	**SE/TE: 3.1** Derivative of a Function, **3.2** Differentiability
LO 2.1C: Calculate derivatives.	**SE/TE: 3.3** Rules for Differentiation, **3.5** Derivatives of Trigonometric Functions, **4.1** Chain Rule, **4.2** Implicit Differentiation, **4.3** Derivatives of Inverse Trigonometric Functions, **4.4** Derivatives of Exponential and Logarithmic Functions, **11.1** Parametric Functions, **11.2** Vectors in the Plane, **11.3** Polar Functions

EU = Enduring Understanding, LO = Learning Objective, BC only topics
SE = Student Edition, TE = Teacher's Edition

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LO 2.1D: Determine higher order derivatives.	**SE/TE: 3.3** Rules for Differentiation, **4.2** Implicit Differentiation
EU 2.2: A function's derivative, which is itself a function, can be used to understand the behavior of the function.	**SE/TE: 2.4** Rates of Change, Tangent Lines, and Sensitivity
LO 2.2A: Use derivatives to analyze properties of a function.	**SE/TE: 5.1** Extreme Values of Functions, **5.2** Mean Value Theorem, **5.3** Connecting *f'* and *f"* with the Graph of *f*, **11.1** Parametric Functions, **11.2** Vectors in the Plane, **11.3** Polar Functions
LO 2.2B: Recognize the connection between differentiability and continuity.	**SE/TE: 3.2** Differentiability
EU 2.3: The derivative has multiple interpretations and applications including those that involve instantaneous rates of change.	
LO 2.3A: Interpret the meaning of a derivative within a problem.	**SE/TE: 2.4** Rates of Change, Tangent Lines, and Sensitivity, **3.1** Derivative of a Function, **3.4** Velocity and Other Rates of Change, **5.5** Linearization, Sensitivity, and Differentials
LO 2.3B: Solve problems involving the slope of a tangent line.	**SE/TE: 2.4** Rates of Change, Tangent Lines, **3.4** Velocity and Other Rates of Change, **5.5** Linearization, Sensitivity, and Differentials
LO 2.3C: Solve problems involving related rates, optimization, rectilinear motion, (BC) and planar motion.	**SE/TE: 3.4** Velocity and Other Rates of Change, **5.1** Extreme Values of Functions, **5.3** Connecting *f'* and *f"* with the Graph of *f*, **5.4** Modeling and Optimization, **5.6** Related Rates, **11.1** Parametric Functions, **11.2** Vectors in the Plane, **11.3** Polar Functions
LO 2.3D: Solve problems involving rates of change in applied contexts.	**SE/TE: 5.5** Linearization, Sensitivity, and Differentials, **5.6** Related Rates
LO 2.3E: Verify solutions to differential equations.	**SE/TE: 7.1** Slope Fields and Euler's Method
LO 2.3F: Estimate solutions to differential equations.	**SE/TE: 7.1** Slope Fields and Euler's Method

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EU 2.4: The Mean Value Theorem connects the behavior of a differentiable function over an interval to the behavior of the derivative of that function at a particular point in the interval.	
LO 2.4A: Apply the Mean Value Theorem to describe the behavior of a function over an interval.	**SE/TE: 5.2** Mean Value Theorem
Big Idea 3: Integrals and the Fundamental Theorem of Calculus	
EU 3.1: Antidifferentiation is the inverse process of differentiation.	
LO 3.1A: Recognize antiderivatives of basic functions.	**SE/TE: 6.3** Definite Integrals and Antiderivatives
EU 3.2: The definite integral of a function over an interval is the limit of a Riemann sum over that interval and can be calculated using a variety of strategies.	
LO 3.2A(a): Interpret the definite integral as the limit of a Riemann sum.	**SE/TE: 6.1** Estimating with Finite Sums, **6.2** Definite Integrals
LO 3.2A(b): Express the limit of a Riemann sum in integral notation.	**SE/TE: 6.2** Definite Integrals
LO 3.2B: Approximate a definite integral.	**SE/TE: 6.1** Estimating with Finite Sums, **6.2** Definite Integrals, **6.5** Trapezoidal Rule
LO 3.2C: Calculate a definite integral using areas and properties of definite integrals.	**SE/TE: 6.2** Definite Integrals, **6.3** Definite Integrals and Antiderivatives
LO 3.2D: (BC) Evaluate an improper integral or show that an improper integral diverges.	**SE/TE: 9.4** Improper Integrals
EU 3.3: The Fundamental Theorem of Calculus, which has two distinct formulations, connects differentiation and integration.	
LO 3.3A: Analyze functions defined by an integral.	**SE/TE: 6.1** Estimating with Finite Sums, **6.2** Definite Integrals, **6.3** Definite Integrals and Antiderivatives, **6.4** Fundamental Theorem of Calculus, **8.1** Accumulation and Net Change
LO 3.3B(a): Calculate antiderivatives.	**SE/TE: 6.3** Definite Integrals and Antiderivatives, **6.4** Fundamental Theorem of Calculus, **7.2** Antidifferentiation by Substitution, **7.3** Antidifferentiation by Parts, **7.5** Logistic Growth

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LO 3.3B(b): Evaluate definite integrals.	**SE/TE: 6.3** Definite Integrals and Antiderivatives, **6.4** Fundamental Theorem of Calculus, **7.2** Antidifferentiation by Substitution, **7.3** Antidifferentiation by Parts, **7.5** Logistic Growth
EU 3.4: The definite integral of a function over an interval is a mathematical tool with many interpretations and applications involving accumulation.	
LO 3.4A: Interpret the meaning of a definite integral within a problem.	**SE/TE: 6.1** Estimating with Finite Sums, **6.2** Definite Integrals, **8.1** Accumulation and Net Change, **8.5** Applications from Science and Statistics
LO 3.4B: Apply definite integrals to problems involving the average value of a function.	**SE/TE: 6.3** Definite Integrals and Antiderivatives
LO 3.4C: Apply definite integrals to problems involving motion.	**SE/TE: 6.1** Estimating with Finite Sums, **8.1** Accumulation and Net Change, **11.1** Parametric Functions, **11.2** Vectors in the Plane, **11.3** Polar Functions
LO 3.4D: Apply definite integrals to problems involving area, volume, (BC) and length of a curve.	**SE/TE: 8.2** Areas in the Plane, **8.3** Volumes, **8.4** Lengths of Curves
LO 3.4E: Use the definite integral to solve problems in various contexts.	**SE/TE: 6.1** Estimating with Finite Sums, .1 Accumulation and Net Change, **8.5** Applications from Science and Statistics
EU 3.5: Antidifferentiation is an underlying concept involved in solving separable differential equations. Solving separable differential equations involves determining a function or relation given its rate of change.	
LO 3.5A: Analyze differential equations to obtain general solutions.	**SE/TE: 7.1** Slope Fields and Euler's Method, **7.4** Exponential Growth and Decay, **7.5** Logistic Growth
LO 3.5B: Interpret, create, and solve differential equations from problems in context.	**SE/TE: 7.1** Slope Fields and Euler's Method, **7.4** Exponential Growth and Decay, **7.5** Logistic Growth

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Big Idea 4: Series (BC)	
EU 4.1: The sum of an infinite number of real numbers may converge.	
LO 4.1A Determine whether a series converges or diverges.	**SE/TE: 9.1** Sequences, **10.1** Power Series, **10.4** Radius of Convergence, **10.5** Testing Convergence at Endpoints
LO 4.1B: Determine or estimate the sum of a series.	**SE/TE: 10.1** Power Series
EU 4.2: A function can be represented by an associated power series over the interval of convergence for the power series.	
LO 4.2A: Construct and use Taylor polynomials.	**SE/TE: 10.2** Taylor Series, **10.3** Taylor's Theorem
LO 4.2B: Write a power series representing a given function.	**SE/TE: 10.1** Power Series, **10.2** Taylor Series, **10.3** Taylor's Theorem
LO 4.2C: Determine the radius and interval of convergence of a power series.	**SE/TE: 10.4** Radius of Convergence, **10.5** Testing Convergence at Endpoints