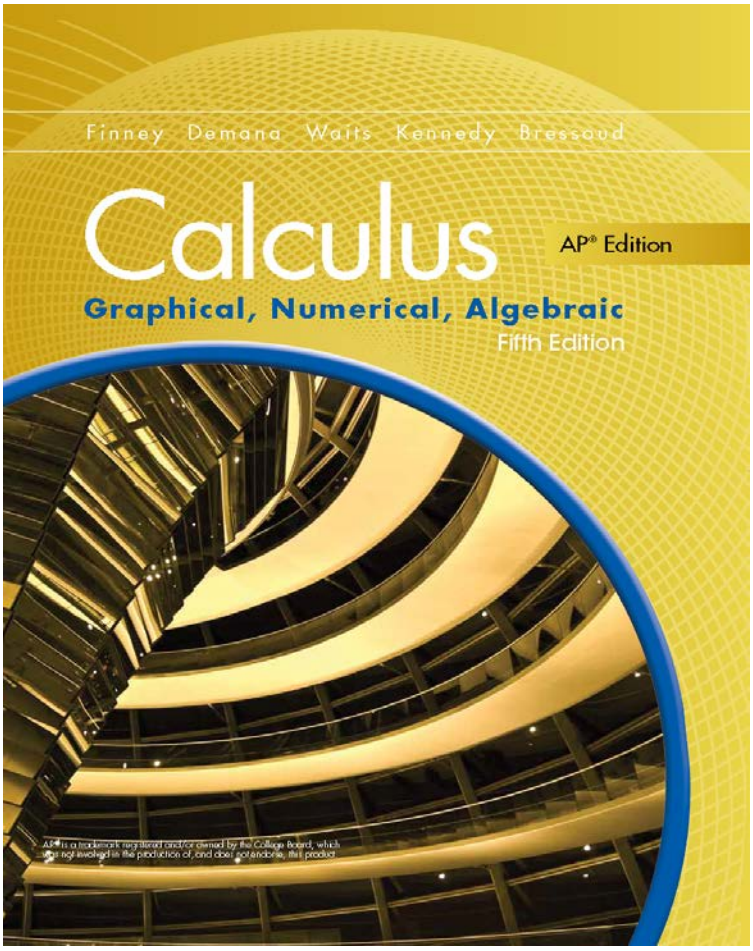
A Correlation of

Calculus

Graphical, Numerical, Algebraic

5e AP® Edition, ©2016

Finney, Demana, Waits, Kennedy, & Bressoud



To the

Advanced Placement Calculus AB / BC Standards

ALWAYS LEARNING PEARSON

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

AP Calculus AB and 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.

AP Calculus AB and BC Curriculum Framework	Calculus Graphical, Numerical, Algebraic, ©2016 Section References
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, 2.2
LO 1.1A(b): Interpret limits expressed symbolically.	**SE/TE:** 2.1, 2.2
LO 1.1B: Estimate limits of functions.	**SE/TE:** 2.1, 2.2
LO 1.1C: Determine limits of functions.	**SE/TE:** 2.1, 2.2, 9.2, 9.3
LO 1.1D: Deduce and interpret behavior of functions using limits.	**SE/TE:** 2.1, 2.2, 9.3
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
LO 1.2B: Determine the applicability of important calculus theorems using continuity.	**SE/TE:** 2.3, 5.1, 5.2, 6.2–4
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
LO 2.1B: Estimate the derivative.	**SE/TE:** 3.1, 3.2
LO 2.1C: Calculate derivatives.	**SE/TE:** 3.3, 3.5, 4.1–4, 11.1–3
LO 2.1D: Determine higher order derivatives.	**SE/TE:** 3.3, 4.2
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

AP Calculus AB and BC Curriculum Framework	**Calculus Graphical, Numerical, Algebraic, ©2016 Section References**
LO 2.2A: Use derivatives to analyze properties of a function.	**SE/TE:** 5.1–3, 11.1–3
LO 2.2B: Recognize the connection between differentiability and continuity.	**SE/TE:** 3.2
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, 3.1, 3.4, 5.5
LO 2.3B: Solve problems involving the slope of a tangent line.	**SE/TE:** 2.4, 3.4, 5.5
LO 2.3C: Solve problems involving related rates, optimization, rectilinear motion, (BC) and planar motion.	**SE/TE:** 3.4, 5.1, 5.3,5.4, 5.6, 11.1–3
LO 2.3D: Solve problems involving rates of change in applied contexts.	**SE/TE:** 5.5, 5.6
LO 2.3E: Verify solutions to differential equations.	**SE/TE:** 7.1
LO 2.3F: Estimate solutions to differential equations.	**SE/TE:** 7.1
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
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

AP Calculus AB and BC Curriculum Framework	Calculus Graphical, Numerical, Algebraic, ©2016 Section References
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, 6.2
LO 3.2A(b): Express the limit of a Riemann sum in integral notation.	**SE/TE:** 6.2
LO 3.2B: Approximate a definite integral.	**SE/TE:** 6.1, 6.2, 6.5
LO 3.2C: Calculate a definite integral using areas and properties of definite integrals.	**SE/TE:** 6.2, 6.3
LO 3.2D: (BC) Evaluate an improper integral or show that an improper integral diverges.	**SE/TE:** 9.4
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:** 6.1–4, 8.1
LO 3.3B(a): Calculate antiderivatives.	**SE/TE:** 6.3, 6.4, 7.2, 7.3, 7.5
LO 3.3B(b): Evaluate definite integrals.	**SE/TE:** 6.3, 6.4, 7.2, 7.3, 7.5
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, 6.2, 8.1, 8.5
LO 3.4B: Apply definite integrals to problems involving the average value of a function.	**SE/TE:** 6.3
LO 3.4C: Apply definite integrals to problems involving motion.	**SE/TE:** 6.1, 8.1, 11.1–3

AP Calculus AB and BC Curriculum Framework	Calculus Graphical, Numerical, Algebraic, ©2016 Section References
LO 3.4D: Apply definite integrals to problems involving area, volume, (BC) and length of a curve.	**SE/TE:** 8.2, 8.3, 8.4
LO 3.4E: Use the definite integral to solve problems in various contexts.	**SE/TE:** 6.1, 8.1, 8.5
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, 7.4, 7.5
LO 3.5B: Interpret, create, and solve differential equations from problems in context.	**SE/TE:** 7.1, 7.4, 7.5
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, 10.1, 10.4, 10.5
LO 4.1B: Determine or estimate the sum of a series.	**SE/TE:** 10.1
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, 10.3
LO 4.2B: Write a power series representing a given function.	**SE/TE:** 10.1–3
LO 4.2C: Determine the radius and interval of convergence of a power series.	**SE/TE:** 10.4, 10.5