

Thinkwell's Homeschool AP Calculus BC Course Lesson Plan: 25 weeks

Welcome to Thinkwell's Homeschool AP Calculus BC! We're thrilled that you've decided to make us part of your homeschool curriculum. This lesson plan is meant to be a guide for you and your homeschool student. Each day, you'll tackle a different topic and all the materials associated with that topic, such as video lectures, exercises, and notes. If you follow our day-by-day schedule, you'll complete the full curriculum for the course in 25 weeks. Feel free to modify and amend the plan as it best works for you. And, as always, please [let us know](#) what we can do to help you get up and running with Thinkwell's AP Calculus BC!

Schedule Overview:

Week 1	Chapter 1: An Introduction to Calculus II
Weeks 1 – 6	Chapter 2: Techniques of Integration
Weeks 7 – 10	Chapter 3: Parametric Equations and Polar Coordinates
Week 11	Midterm
Weeks 11 – 20	Chapter 4: Sequences and Series
Weeks 20 – 21	Chapter 5: Differential Equations
Weeks 22 – 24	Chapter 6: Vector Calculus and the Geometry of R^2 and R^3
Week 25	Final Exam

Week 1 Chapter 1: An Introduction to Calculus II Chapter 2: Techniques of Integration	
Assignments	Notes
Week 1, Day 1 1.1.1 Welcome to Calculus II (4:00) 1.1.2 Review: Calculus I in 20 Minutes (19:15)	
Week 1, Day 2 2.1.1 An Introduction to the Integral Table (6:38)	
Week 1, Day 3 2.1.2 Making u-Substitutions (9:30)	
Week 1, Day 4 2.2.1 An Introduction to Integrals with Powers of Sine and Cosine (11:15)	
Week 1, Day 5 2.2.2 Integrals with Powers of Sine and Cosine (12:09)	

Week 2	
Chapter 2: Techniques of Integration	
Assignments	Notes
Week 2, Day 1	
2.2.3 Integrals with Even and Odd Powers of Sine and Cosine (11:00)	
Week 2, Day 2	
2.3.1 Integrals of Other Trigonometric Functions (9:01)	
Week 2, Day 3	
2.3.2 Integrals with Odd Powers of Tangent and Any Power of Secant (10:26)	
Week 2, Day 4	
2.3.3 Integrals with Even Powers of Secant and Any Power of Tangent (7:50)	
Week 2, Day 5	
2.4.1 Finding Partial Fraction Decompositions (13:07)	

Week 3	
Chapter 2: Techniques of Integration	
Assignments	Notes
Week 3, Day 1	
2.4.2 Partial Fractions (10:58)	
Week 3, Day 2	
2.4.3 Long Division (9:33)	
Week 3, Day 3	
2.5.1 Repeated Linear Factors: Part One (9:52)	
Week 3, Day 4	
2.5.2 Repeated Linear Factors: Part Two (15:19)	
Week 3, Day 5	
2.5.3 Distinct and Repeated Quadratic Factors (11:09)	

Week 4	
Chapter 2: Techniques of Integration	
Assignments	Notes
Week 4, Day 1	
2.5.4 Partial Fractions of Transcendental Functions (10:53)	
Week 4, Day 2	
2.6.1 An Introduction to Integration by Parts (12:25)	
Week 4, Day 3	
2.6.2 Applying Integration by Parts to the Natural Log Function (8:11)	
Week 4, Day 4	
2.6.3 Inspirational Examples of Integration by Parts (9:18)	
Week 4, Day 5	
2.6.4 Repeated Application of Integration by Parts (9:32)	

Week 5 Chapter 2: Techniques of Integration	
Assignments	Notes
Week 5, Day 1 2.6.5 Algebraic Manipulation and Integration by Parts (13:37)	
Week 5, Day 2 2.7.1 Converting Radicals into Trigonometric Expressions (10:01)	
Week 5, Day 3 2.7.2 Using Trigonometric Substitution to Integrate Radicals (11:35)	
Week 5, Day 4 2.7.3 Trigonometric Substitutions on Rational Powers (9:20)	
Week 5, Day 5 2.8.1 An Overview of Trigonometric Substitution Strategy (5:18)	

Week 6 Chapter 2: Techniques of Integration Chapter 2 Test	
Assignments	Notes
Week 6, Day 1 2.8.2 Trigonometric Substitution Involving a Definite Integral: Part One (12:41)	
Week 6, Day 2 2.8.3 Trigonometric Substitution Involving a Definite Integral: Part Two (9:04)	
Week 6, Day 3 2.9.1 More Calculus of Inverse Trigonometric Functions (9:32)	
Week 6, Day 4 Chapter 2 Practice Test	
Week 6, Day 5 Chapter 2 Test	Chapter 2 Test Score: _____

Week 7 Chapter 3: Parametric Equations and Polar Coordinates	
Assignments	Notes
Week 7, Day 1 3.1.1 An Introduction to Parametric Equations (11:47)	
Week 7, Day 2 3.1.2 The Cycloid (12:30)	
Week 7, Day 3 3.1.3 Eliminating Parameters (8:04)	
Week 7, Day 4 3.2.1 Derivatives of Parametric Equations (12:43)	
Week 7, Day 5 3.2.2 Graphing the Elliptic Curve (12:28)	

Week 8 Chapter 3: Parametric Equations and Polar Coordinates	
Assignments	Notes
Week 8, Day 1 3.2.3 The Arc Length of a Parameterized Curve (10:04)	
Week 8, Day 2 3.2.4 Finding Arc Lengths of Curves Given by Parametric Equations (15:04)	
Week 8, Day 3 3.3.1 The Polar Coordinate System (12:31)	
Week 8, Day 4 3.3.2 Converting between Polar and Cartesian Forms (9:36)	
Week 8, Day 5 3.3.3 Spirals and Circles (9:23)	

Week 9 Chapter 3: Parametric Equations and Polar Coordinates	
Assignments	Notes
Week 9, Day 1 3.3.4 Graphing Some Special Polar Functions (8:22)	
Week 9, Day 2 3.4.1 Calculus and the Rose Curve (17:59)	
Week 9, Day 3 3.4.2 Finding the Slopes of Tangent Lines in Polar form (7:34)	
Week 9, Day 4 3.5.1 Heading toward the Area of a Polar Region (12:58)	
Week 9, Day 5 3.5.2 Finding the Area of a Polar Region: Part One (8:49)	

Week 10 Chapter 3: Parametric Equations and Polar Coordinates Chapter 3 Test	
Assignments	Notes
Week 10, Day 1 3.5.3 Finding the Area of a Polar Region: Part Two (9:17)	
Week 10, Day 2 3.5.4 The Area of a Region Bounded by Two Polar Curves: Part One (10:46)	
Week 10, Day 3 3.5.5 The Area of a Region Bounded by Two Polar Curves: Part Two (9:34)	
Week 10, Day 4 Chapter 3 Practice Test	
Week 10, Day 5 Chapter 3 Test	Chapter 3 Test Score: _____

Week 11 Midterm Exam Chapter 4: Sequences and Series	
Assignments	Notes
Week 11, Day 1 Practice Midterm Exam	
Week 11, Day 2 Midterm Exam	Midterm Exam Score: _____
Week 11, Day 3 4.1.1 The Limit of a Sequence (10:18)	
Week 11, Day 4 4.1.2 Determining the Limit of a Sequence (9:14)	
Week 11, Day 5 4.1.3 The Squeeze and Absolute Value Theorems (7:55)	

Week 12 Chapter 4: Sequences of Series	
Assignments	Notes
Week 12, Day 1 4.2.1 Monotonic and Bounded Sequences (9:42)	
Week 12, Day 2 4.3.1 An Introduction to Infinite Series (11:28)	
Week 12, Day 3 4.3.2 The Summation of Infinite Series (11:21)	
Week 12, Day 4 4.3.3 Geometric Series (13:21)	
Week 12, Day 5 4.3.4 Telescoping Series (8:22)	

Week 13 Chapter 4: Sequences of Series	
Assignments	Notes
Week 13, Day 1 4.4.1 Properties of Convergent Series (7:23)	
Week 13, Day 2 4.4.2 The nth-Term Test for Divergence (8:58)	
Week 13, Day 3 4.5.1 An Introduction to the Integral Test (12:45)	
Week 13, Day 4 4.5.2 Examples of the Integral Test (8:08)	
Week 13, Day 5 4.5.3 Using the Integral Test (13:58)	

Week 14	
Chapter 4: Sequences and Series	
Assignments	Notes
Week 14, Day 1	
4.5.4 Defining p-Series (9:36)	
Week 14, Day 2	
4.6.1 An Introduction to the Direct Comparison Test (14:03)	
Week 14, Day 3	
4.6.2 Using the Direct Comparison Test (10:10)	
Week 14, Day 4	
4.7.1 An Introduction to the Limit Comparison Test (10:49)	
Week 14, Day 5	
4.7.2 Using the Limit Comparison Test (11:09)	

Week 15	
Chapter 4: Sequences and Series	
Assignments	Notes
Week 15, Day 1	
4.7.3 Inverting the Series in the Limit Comparison Test (12:55)	
Week 15, Day 2	
4.8.1 Alternating Series (9:36)	
Week 15, Day 3	
4.8.2 The Alternating Series Test (7:20)	
Week 15, Day 4	
4.8.3 Estimating the Sum of an Alternating Series (9:36)	
Week 15, Day 5	
4.9.1 Absolute and Conditional Convergence (12:13)	

Week 16	
Chapter 4: Sequences and Series	
Assignments	Notes
Week 16, Day 1	
4.10.1 The Ratio Test (13:15)	
Week 16, Day 2	
4.10.2 Examples of the Ratio Test (10:38)	
Week 16, Day 3	
4.10.3 The Root Test (13:28)	
Week 16, Day 4	
4.11.1 Polynomial Approximation of Elementary Functions (13:15)	
Week 16, Day 5	
4.11.2 Higher-Degree Approximations (14:17)	

Week 17	
Chapter 4: Sequences and Series	
Assignments	Notes
Week 17, Day 1	
4.12.1 Taylor Polynomials (14:32)	
Week 17, Day 2	
4.12.2 Maclaurin Polynomials (9:06)	
Week 17, Day 3	
4.12.3 The Remainder of a Taylor Polynomial (5:48)	
Week 17, Day 4	
4.12.4 Approximating the Value of a Function (6:10)	
Week 17, Day 5	
4.13.1 Taylor Series (4:45)	

Week 18	
Chapter 4: Sequences and Series	
Assignments	Notes
Week 18, Day 1	
4.13.2 Examples of the Taylor and Maclaurin Series (9:42)	
Week 18, Day 2	
4.13.3 New Taylor Series (7:39)	
Week 18, Day 3	
4.13.4 The Convergence of Taylor Series (14:40)	
Week 18, Day 4	
4.14.1 The Definition of Power Series (6:01)	
Week 18, Day 5	
4.14.2 The Interval and Radius of Convergence (10:27)	

Week 19	
Chapter 4: Sequences and Series	
Assignments	Notes
Week 19, Day 1	
4.14.3 Finding the Interval and Radius of Convergence: Part One (14:02)	
Week 19, Day 2	
4.14.4 Finding the Interval and Radius of Convergence: Part Two (11:19)	
Week 19, Day 3	
4.14.5 Finding the Interval and Radius of Convergence: Part Three (10:00)	
Week 19, Day 4	
4.15.1 Differentiation and Integration of Power Series (7:59)	
Week 19, Day 5	
4.15.2 Finding Power Series Representations by Differentiation (4:03)	

Week 20 Chapter 4: Sequences and Series Chapter 4 Test Chapter 5: Differential Equations	
Assignments	Notes
Week 20, Day 1 4.15.3 Finding Power Series Representations by Integration (5:39)	
Week 20, Day 2 4.15.4 Integrating Functions Using Power Series (5:39)	
Week 20, Day 3 Chapter 4 Practice Test	
Week 20, Day 4 Chapter 4 Test	Chapter 4 Test Score: _____
Week 20, Day 5 5.1.1 Separating Homogeneous Differential Equations (10:55)	

Week 21 Chapter 5: Differential Equations Chapter 5 Test	
Assignments	Notes
Week 21, Day 1 5.1.2 Change of Variables (7:48)	
Week 21, Day 2 5.2.1 First-Order Linear Differential Equations (9:12)	
Week 21, Day 3 5.2.2 Using Integrating Factors (7:37)	
Week 21, Day 4 Chapter 5 Practice Test	
Week 21, Day 5 Chapter 5 Test	Chapter 5 Test Score: _____

Week 22 Chapter 6: Vector Calculus and the Geometry of \mathbb{R}^2 and \mathbb{R}^3	
Assignments	Notes
Week 22, Day 1 6.1.1 Coordinate Geometry in Three-Dimensional Space (20:12)	
Week 22, Day 2 6.1.2 Introduction to Vectors (9:50)	
Week 22, Day 3 6.1.3 Vectors in \mathbb{R}^2 and \mathbb{R}^3 (20:07)	
Week 22, Day 4 6.1.4 An Introduction to the Dot Product (18:50)	
Week 22, Day 5 6.1.5 Orthogonal Projections (9:25)	

Week 23	
Chapter 6: Vector Calculus and the Geometry of \mathbb{R}^2 and \mathbb{R}^3	
Assignments	Notes
Week 23, Day 1	
6.1.6 An Introduction to the Cross Product (15:56)	
Week 23, Day 2	
6.1.7 Geometry of the Cross Product (16:41)	
Week 23, Day 3	
6.1.8 Equations of Lines and Planes in \mathbb{R}^3 (27:21)	
Week 23, Day 4	
6.2.1 Introduction to Vector Functions (13:47)	
Week 23, Day 5	
6.2.2 Derivatives of Vector Functions (19:54)	

Week 24	
Chapter 6: Vector Calculus and the Geometry of \mathbb{R}^2 and \mathbb{R}^3	
Assignments	Notes
Week 24, Day 1	
6.2.3 Vector Functions: Smooth Curves (4:55)	
Week 24, Day 2	
6.2.4 Vector Functions: Velocity and Acceleration (22:08)	
Week 24, Day 3	
Chapter 6 Practice Test	
Week 24, Day 4	Chapter 6 Test
Chapter 6 Test	Score: _____
Week 24, Day 5	
Study for Final Exam	

Week 25	
Final Exam	
Assignments	Notes
Week 25, Day 1	
Study for Final Exam	
Week 25, Day 2	
Study for Final Exam	
Week 25, Day 3	
Study for Final Exam	
Week 25, Day 4	
Practice Final Exam	
Week 25, Day 5	Final Exam
Final Exam	Score: _____