

Thinkwell's Homeschool AP Calculus AB

Course Lesson Plan: 38 weeks

Welcome to Thinkwell's Homeschool AP Calculus AB! 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 38 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 AB!

Schedule Overview:

Weeks 1 – 2	Chapter 1: The Basics
Weeks 2 – 5	Chapter 2: Limits
Weeks 5 – 7	Chapter 3: An Introduction to Derivatives
Weeks 7 – 9	Chapter 4: Computational Techniques
Weeks 9 – 11	Chapter 5: Special Functions
Weeks 11 – 15	Chapter 6: Implicit Differentiation and the Inverse Functions
Week 15	Midterm
Weeks 16 – 19	Chapter 7: Applications of Differentiation
Weeks 19 – 22	Chapter 8: Curve Sketching
Weeks 23 – 27	Chapter 9: The Basics of Integration
Weeks 27 – 33	Chapter 10: Applications of Integration
Weeks 33 – 35	Chapter 11: Differential Equations
Weeks 35 – 37	Chapter 12: L'Hopital's Rule and Improper Integrals
<i>Optional</i>	Chapter 13: Math Fun
Week 38	Final Exam

Week 1 Chapter 1: The Basics	
Assignments	Notes
Week 1, Day 1 1.1.1 An Introduction to Thinkwell's Calculus (2:31) 1.1.2 The Two Questions of Calculus (15:07)	
Week 1, Day 2 1.1.3 Average Rates of Change (11:00) 1.1.4 How to Do Math (4:46)	
Week 1, Day 3 1.2.1 Functions (19:08)	
Week 1, Day 4 1.2.2 Graphing Lines (27:28)	
Week 1, Day 5 1.2.3 Parabolas (21:30)	

Week 2 Chapter 1: The Basics Chapter 1 Test Chapter 2: Limits	
Assignments	Notes
Week 2, Day 1 1.2.4 Some Non-Euclidean Geometry (7:54)	
Week 2, Day 2 Chapter 1 Practice Test	
Week 2, Day 3 Chapter 1 Test	Chapter 1 Test Score: _____
Week 2, Day 4 2.1.1 Finding Rate of Change over an Interval (18:22)	
Week 2, Day 5 2.1.2 Finding Limits Graphically (14:40)	

Week 3 Chapter 2: Limits	
Assignments	Notes
Week 3, Day 1 2.1.3 The Formal Definition of a Limit (5:34)	
Week 3, Day 2 2.1.4 The Limit Laws, Part I (2:31)	
Week 3, Day 3 2.1.5 The Limit Laws, Part II (13:55)	
Week 3, Day 4 2.1.6 One-Sided Limits (5:18)	
Week 3, Day 5 2.1.7 The Squeeze Theorem (12:40)	

Week 4	
Chapter 2: Limits	
Assignments	Notes
Week 4, Day 1	
2.1.8 Continuity and Discontinuity (3:39)	
Week 4, Day 2	
2.2.1 Evaluating Limits (19:09)	
Week 4, Day 3	
2.2.2 Limits and Indeterminate Forms (18:55)	
Week 4, Day 4	
2.2.3 Two Techniques for Evaluating Limits (17:55)	
Week 4, Day 5	
2.2.4 An Overview of Limits (14:14)	

Week 5	
Chapter 2: Limits	
Chapter 2 Test	
Chapter 3: An Introduction to Derivatives	
Assignments	Notes
Week 5, Day 1	
Chapter 2 Practice Test	
Week 5, Day 2	Chapter 2 Test
Chapter 2 Test	Score: _____
Week 5, Day 3	
3.1.1 Rates of Change, Secants, and Tangents (18:53)	
Week 5, Day 4	
3.1.2 Finding Instantaneous Velocity (19:56)	
Week 5, Day 5	
3.1.3 The Derivative (11:14)	

Week 6	
Chapter 3: An Introduction to Derivatives	
Assignments	Notes
Week 6, Day 1	
3.1.4 Differentiability (2:35)	
Week 6, Day 2	
3.2.1 The Slope of a Tangent Line (11:16)	
Week 6, Day 3	
3.2.2 Instantaneous Rate (14:38)	
Week 6, Day 4	
3.2.3 The Equation of a Tangent Line (17:53)	
Week 6, Day 5	
3.2.4 More on Instantaneous Rate (18:32)	

Week 7 Chapter 3: An Introduction to Derivatives Chapter 3 Test Chapter 4: Computational Techniques	
Assignments	Notes
Week 7, Day 1 3.3.1 The Derivative of the Reciprocal Function (17:56)	
Week 7, Day 2 3.3.2 The Derivative of the Square Root Function (15:19)	
Week 7, Day 3 Chapter 3 Practice Test	
Week 7, Day 4 Chapter 3 Test	Chapter 3 Test Score: _____
Week 7, Day 5 4.1.1 A Shortcut for Finding Derivatives (14:03)	

Week 8 Chapter 4: Computational Techniques	
Assignments	Notes
Week 8, Day 1 4.1.2 A Quick Proof of the Power Rule (9:48)	
Week 8, Day 2 4.1.3 Uses of the Power Rule (19:43)	
Week 8, Day 3 4.2.1 The Product Rule (20:43)	
Week 8, Day 4 4.2.2 The Quotient Rule (13:10)	
Week 8, Day 5 4.3.1 An Introduction to the Chain Rule (17:51)	

Week 9 Chapter 4: Computational Techniques Chapter 4 Test Chapter 5: Special Functions	
Assignments	Notes
Week 9, Day 1 4.3.2 Using the Chain Rule (12:53)	
Week 9, Day 2 4.3.3 Combining Computational Techniques (14:24)	
Week 9, Day 3 Chapter 4 Practice Test	
Week 9, Day 4 Chapter 4 Test	Chapter 4 Test Score: _____
Week 9, Day 5 5.1.1 A Review of Trigonometry (11:37)	

Week 10 Chapter 5 Special Functions	
Assignments	Notes
Week 10, Day 1 5.1.2 Graphing Trigonometric Functions (17:12)	
Week 10, Day 2 5.1.3 The Derivatives of Trigonometric Functions (13:39) 5.1.4 The Number Pi (7:24)	
Week 10, Day 3 5.2.1 Graphing Exponential Functions (10:08)	
Week 10, Day 4 5.2.2 Derivatives of Exponential Functions (23:17)	
Week 10, Day 5 5.3.1 Evaluating Logarithmic Functions (18:37)	

Week 11 Chapter 5: Special Functions Chapter 5 Test Chapter 6: Implicit Differentiation and the Inverse Function	
Assignments	Notes
Week 11, Day 1 5.3.2 The Derivative of the Natural Log Function (13:23)	
Week 11, Day 2 5.3.3 Using the Derivative Rules with Transcendental Functions (14:42)	
Week 11, Day 3 Chapter 5 Practice Test	
Week 11, Day 4 Chapter 5 Test	Chapter 5 Test Score: _____
Week 11, Day 5 6.1.1 An Introduction to Implicit Differentiation (14:43)	

Week 12 Chapter 6: Implicit Differentiation and the Inverse Function	
Assignments	Notes
Week 12, Day 1 6.1.2 Finding the Derivative Implicitly (12:14)	
Week 12, Day 2 6.2.1 Using Implicit Differentiation (22:24)	
Week 12, Day 3 6.2.2 Applying Implicit Differentiation (22:53)	
Week 12, Day 4 6.3.1 The Exponential and Natural Log Functions (8:39)	
Week 12, Day 5 6.3.2 Differentiating Logarithmic Functions (12:58)	

Week 13	
Chapter 6: Implicit Differentiation and the Inverse Function	
Assignments	Notes
Week 13, Day 1	
6.3.3 Logarithmic Differentiation (11:36)	
Week 13, Day 2	
6.3.4 The Basics of Inverse Functions (18:25)	
Week 13, Day 3	
6.3.5 Finding the Inverse of a Function (8:22)	
Week 13, Day 4	
6.4.1 Derivatives of Inverse Functions (12:12)	
Week 13, Day 5	
6.5.1 The Inverse Sine, Cosine, and Tangent Functions (11:01)	

Week 14	
Chapter 6: Implicit Differentiation and the Inverse Function	
Assignments	Notes
Week 14, Day 1	
6.5.2 The Inverse Secant, Cosecant, and Cotangent Functions (7:38)	
Week 14, Day 2	
6.5.3 Evaluating Inverse Trigonometric Functions (9:22)	
Week 14, Day 3	
6.6.1 Derivatives of Inverse Trigonometric Functions (11:30)	
Week 14, Day 4	
6.7.1 Defining the Hyperbolic Functions (8:37)	
Week 14, Day 5	
6.7.2 Hyperbolic Identities (10:56)	

Week 15	
Chapter 6: Implicit Differentiation and the Inverse Function	
Chapter 6 Test	
Midterm Exam	
Assignments	Notes
Week 15, Day 1	
6.7.3 Derivatives of Hyperbolic Functions (7:28)	
Week 15, Day 2	
Chapter 6 Practice Test	
Week 15, Day 3	Chapter 6 Test Score: _____
Week 15, Day 4	
Practice Midterm Exam	
Week 15, Day 5	Midterm Exam Score: _____
Midterm Exam	

Week 16	
Chapter 7: Applications of Differentiation	
Assignments	Notes
Week 16, Day 1	
7.1.1 Acceleration and the Derivative (5:44)	
Week 16, Day 2	
7.1.2 Solving Word Problems Involving Distance and Velocity (22:05)	
Week 16, Day 3	
7.2.1 Higher-Order Derivatives and Linear Approximation (20:57)	
Week 16, Day 4	
7.2.2 Using the Tangent Line Approximation Formula (24:22)	
Week 16, Day 5	
7.2.3 Newton's Method (10:36)	

Week 17	
Chapter 7: Applications of Differentiation	
Assignments	Notes
Week 17, Day 1	
7.3.1 The Connection Between Slope and Optimization (27:17)	
Week 17, Day 2	
7.3.2 The Fence Problem (25:03)	
Week 17, Day 3	
7.3.3 The Box Problem (20:38)	
Week 17, Day 4	
7.3.4 The Can Problem (20:47)	
Week 17, Day 5	
7.3.5 The Wire-Cutting Problem (24:40)	

Week 18	
Chapter 7: Applications of Differentiation	
Assignments	Notes
Week 18, Day 1	
7.4.1 The Pebble Problem (15:12)	
Week 18, Day 2	
7.4.2 The Ladder Problem (14:18)	
Week 18, Day 3	
7.4.3 The Baseball Problem (18:21)	
Week 18, Day 4	
7.4.4 The Blimp Problem (12:17)	
7.4.5 Math Anxiety (5:30)	
Week 18, Day 5	
Chapter 7 Practice Test	

Week 19 Chapter 7: Applications of Differentiation Chapter 7 Test Chapter 8: Curve Sketching	
Assignments	Notes
Week 19, Day 1 Chapter 7 Test	Chapter 7 Test Score: _____
Week 19, Day 2 8.1.1 An Introduction to Curve Sketching (8:44)	
Week 19, Day 3 8.1.2 Three Big Theorems (10:38) 8.1.3 Morale Moment (5:38)	
Week 19, Day 4 8.2.1 Critical Points (17:43)	
Week 19, Day 5 8.2.2 Maximum and Minimum (21:59)	

Week 20 Chapter 8: Curve Sketching	
Assignments	Notes
Week 20, Day 1 8.2.3 Regions Where a Function Increases or Decreases (19:54)	
Week 20, Day 2 8.2.4 The First Derivative Test (2:45) 8.2.5 Math Magic (6:55)	
Week 20, Day 3 8.3.1 Concavity and Inflection Points (13:11)	
Week 20, Day 4 8.3.2 Using the Second Derivative to Examine Concavity (17:01)	
Week 20, Day 5 8.3.3 The Mobius Band (12:17) 8.4.1 Graphs of Polynomial Functions (10:13)	

Week 21 Chapter 8: Curve Sketching	
Assignments	Notes
Week 21, Day 1 8.4.2 Cusp Points and the Derivative (13:53)	
Week 21, Day 2 8.4.3 Domain-Restricted Functions and the Derivative (10:20)	
Week 21, Day 3 8.4.4 The Second Derivative Test (3:27)	
Week 21, Day 4 8.5.1 Vertical Asymptotes (8:17)	

Week 21, Day 5 8.5.2 Horizontal Asymptotes and Infinite Limits (17:43)	
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Week 22 Chapter 8: Curve Sketching Chapter 8 Test	
Assignments	Notes
Week 22, Day 1 8.5.3 Graphing Functions with Asymptotes (10:15)	
Week 22, Day 2 8.5.4 Functions with Asymptotes and Holes (3:28)	
Week 22, Day 3 8.5.5 Functions with Asymptotes and Critical Points (17:20)	
Week 22, Day 4 Chapter 8 Practice Test	
Week 22, Day 5 Chapter 8 Test	Chapter 8 Test Score: _____

Week 23 Chapter 9: The Basics of Integration	
Assignments	Notes
Week 23, Day 1 9.1.1 Antidifferentiation (13:59)	
Week 23, Day 2 9.1.2 Antiderivatives of Powers of x (17:56)	
Week 23, Day 3 9.1.3 Antiderivatives of Trigonometric and Exponential Functions (10:24)	
Week 23, Day 4 9.2.1 Undoing the Chain Rule (8:30)	
Week 23, Day 5 9.2.2 Integrating Polynomials by Substitution (15:24)	

Week 24 Chapter 9: The Basics of Integration	
Assignments	Notes
Week 24, Day 1 9.3.1 Integrating Composite Trigonometric Functions by Substitution (12:44)	
Week 24, Day 2 9.3.2 Integrating Composite Exponential and Rational Functions by Substitution (13:30)	
Week 24, Day 3 9.3.3 More Integrating Trigonometric Functions by Substitution (7:19)	
Week 24, Day 4 9.3.4 Choosing Effective Function Decompositions (11:42)	

Week 24, Day 5 9.4.1 Approximating Areas of Plane Regions (9:39)	
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Week 25 Chapter 9: The Basics of Integration	
Assignments	Notes
Week 25, Day 1 9.4.2 Areas, Riemann Sums, and Definite Integrals (13:40)	
Week 25, Day 2 9.4.3 The Fundamental Theorem of Calculus, Part I (11:52)	
Week 25, Day 3 9.4.4 The Fundamental Theorem of Calculus, Part II (16:28)	
Week 25, Day 4 9.4.5 Illustrating the Fundamental Theorem of Calculus (13:55)	
Week 25, Day 5 9.4.6 Evaluating Definite Integrals (12:53)	

Week 26 Chapter 9: The Basics of Integration	
Assignments	Notes
Week 26, Day 1 9.5.1 An Overview of Trigonometric Substitution Strategy (5:18)	
Week 26, Day 2 9.5.2 Trigonometric Substitution Involving a Definite Integral, Part One (12:41)	
Week 26, Day 3 9.5.3 Trigonometric Substitution Involving a Definite Integral, Part Two (9:04)	
Week 26, Day 4 9.6.1 Deriving the Trapezoidal Rule (12:36)	
Week 26, Day 5 9.6.2 An Example of the Trapezoidal Rule (7:15)	

Week 27 Chapter 9: The Basics of Integration Chapter 9 Test Chapter 10: Applications of Integration	
Assignments	Notes
Week 27, Day 1 Chapter 9 Practice Test	
Week 27, Day 2 Chapter 9 Test	Chapter 9 Test Score: _____
Week 27, Day 3 10.1.1 Antiderivatives and Motion (19:51)	

Week 27, Day 4 10.1.2 Gravity and Vertical Motion (18:22)	
Week 27, Day 5 10.1.3 Solving Vertical Motion Problems (11:53)	

Week 28 Chapter 10: Applications of Integration	
Assignments	Notes
Week 28, Day 1 10.2.1 The Area between Two Curves (9:04)	
Week 28, Day 2 10.2.2 Limits of Integration and Area (15:16)	
Week 28, Day 3 10.2.3 Common Mistakes to Avoid When Finding Areas (15:36)	
Week 28, Day 4 10.2.4 Regions Bound by Several Curves (11:13)	
Week 28, Day 5 10.3.1 Finding Areas by Integrating with Respect to y : Part One (8:15)	

Week 29 Chapter 10: Applications of Integration	
Assignments	Notes
Week 29, Day 1 10.3.2 Finding Areas by Integrating with Respect to y : Part Two (18:50)	
Week 29, Day 2 10.3.3 Area, Integration by Substitution, and Trigonometry (11:43)	
Week 29, Day 3 10.4.1 Finding the Average Value of a Function (8:18)	
Week 29, Day 4 10.5.1 Finding Volumes Using Cross-Sectional Slices (9:58)	
Week 29, Day 5 10.5.2 An Example of Finding Cross-Sectional Volumes (12:02)	

Week 30 Chapter 10: Applications of Integration	
Assignments	Notes
Week 30, Day 1 10.6.1 Solids of Revolution (11:50)	
Week 30, Day 2 10.6.2 The Disk Method along the y -Axis (11:43)	
Week 30, Day 3 10.6.3 A Transcendental Example of the Disk Method (9:39)	
Week 30, Day 4 10.6.4 The Washer Method across the x -Axis (13:11)	

Week 30, Day 5 10.6.5 The Washer Method across the y-Axis (13:11)	
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Week 31 Chapter 10: Applications of Integration	
Assignments	Notes
Week 31, Day 1 10.7.1 Introducing the Shell Method (13:18)	
Week 31, Day 2 10.7.2 Why Shells Can Be Better Than Washers (12:05)	
Week 31, Day 3 10.7.3 The Shell Method: Integrating with Respect to y (11:41)	
Week 31, Day 4 10.8.1 An Introduction to Work (4:07)	
Week 31, Day 5 10.8.2 Calculating Work (4:53)	

Week 32 Chapter 10: Applications of Integration	
Assignments	Notes
Week 32, Day 1 10.8.3 Hooke's Law (5:00)	
Week 32, Day 2 10.9.1 Center of Mass (8:57)	
Week 32, Day 3 10.9.2 The Center of Mass of a Thin Plate (11:35)	
Week 32, Day 4 10.10.1 An Introduction to Arc Length (11:33)	
Week 32, Day 5 10.10.2 Finding Arc Lengths of Curves Given by Functions (13:44)	

Week 33 Chapter 10: Applications of Integration Chapter 10 Test Chapter 11: Differential Equations	
Assignments	Notes
Week 33, Day 1 Chapter 10 Practice Test	
Week 33, Day 2 Chapter 10 Test	Chapter 10 Test Score: _____
Week 33, Day 3 11.1.1 An Introduction to Differential Equations (10:57)	

Week 33, Day 4 11.1.2 Solving Separable Differential Equations (8:44)	
Week 33, Day 5 11.1.3 Finding a Particular Solution (6:25)	

Week 34 Chapter 11: Differential Equations	
Assignments	Notes
Week 34, Day 1 11.1.4 Direction Fields (5:49)	
Week 34, Day 2 11.1.5 Euler's Method for Solving Differential Equations Numerically (19:47)	
Week 34, Day 3 11.2.1 Exponential Growth (12:20)	
Week 34, Day 4 11.2.2 Logistic Growth (29:15)	
Week 34, Day 5 11.2.3 Radioactive Decay (8:05)	

Week 35 Chapter 11: Differential Equations Chapter 11 Test Chapter 12: L'Hopital's Rule and Improper Integrals	
Assignments	Notes
Week 35, Day 1 Chapter 11 Practice Test	
Week 35, Day 2 Chapter 11 Test	Chapter 11 Test Score: _____
Week 35, Day 3 12.1.1 Indeterminate Forms (8:52)	
Week 35, Day 4 12.1.2 An Introduction to L'Hopital's Rule (7:44)	
Week 35, Day 5 12.1.3 Basic Uses of L'Hopital's Rule (10:53)	

Week 36 Chapter 12: L'Hopital's Rule and Improper Integrals	
Assignments	Notes
Week 36, Day 1 12.1.4 More Exotic Examples of Indeterminate Forms (12:48)	
Week 36, Day 2 12.2.1 L'Hopital's Rule and Indeterminate Products (7:46)	

Week 36, Day 3 12.2.2 L'Hopital's Rule and Indeterminate Differences (14:38)	
Week 36, Day 4 12.2.3 L'Hopital's Rule and One to the Infinite Power (11:45)	
Week 36, Day 5 12.2.4 Another Example of One to the Infinite Power (7:52)	

Week 37 Chapter 12: L'Hopital's Rule and Improper Integrals	
Assignments	Notes
Week 37, Day 1 12.3.1 The First Type of Improper Integral (9:42)	
Week 37, Day 2 12.3.2 The Second Type of Improper Integral (7:26)	
Week 37, Day 3 12.3.3 Infinite Limits of Integration, Convergence, and Divergence (11:50)	
Week 37, Day 4 Chapter 12 Practice Test	
Week 37, Day 5 Chapter 12 Test	Chapter 12 Test Score: _____

Optional Chapter 13: Math Fun	
13.1.1 An Introduction to Paradoxes (4:56)	
13.1.2 Paradoxes and Air Safety (8:46)	
13.1.3 Newcomb's Paradox (9:31)	
13.1.4 Zeno's Paradox (5:56)	
13.2.1 Fibonacci Numbers (11:22)	
13.2.2 The Golden Ratio (9:31)	
13.3.1 A Glimpse Into Calculus II (12:13)	

Week 38 Final Exam	
Assignments	Notes
Week 38, Day 1 Study for Final Exam	
Week 38, Day 2 Study for Final Exam	
Week 38, Day 3 Study for Final Exam	
Week 38, Day 4 Practice Final Exam	
Week 38, Day 5 Final Exam	Final Exam Score: _____