



T E A C H Y O U R S E L F

CALCULUS

Table of Contents

Introduction	3
Minimum System and Hardware Requirements.....	4
Installation Instructions	5
The Teach Yourself Calculus Window	6
Exiting the Program	7
The Course of Study	7
Let's Begin!	9
The Guided Tour	9
Enter and Sign-In Please!	9
The Main Menu	10
Interactive Learning	11
Interactive Learning Contents Page	11
Detailed Table of Contents	12
The Glossary	13
Rules and Proofs	13
Interactive Learning Pages	14
Need a Break?	16
Need Help?	16
The Textbook	17
Inside the Textbook	18
“Hotwords”	20
The Exercises	21
Confirm, Clue, and Reveal Icons	21
Certificate of Success	21
The Overviews	21
Test Your Knowledge	22
Summary	24

© 1999 © 1999 Riverdeep Interactive Learning Limited, and its licensors. All rights reserved. Uses Smacker Video Technology. Copyright © 1994-1998 by RAD Game Tools, Inc. All rights reserved. Adobe® Acrobat® © 2000 Adobe Systems Incorporated. The Learning Company is a registered trademark, and Mind Power is a trademark of Riverdeep Interactive Learning Limited. Windows is either a registered trademark or a trademark of Microsoft Corporation in the United States and/or other countries. Macintosh and Mac are registered trademarks of Apple Computer, Inc. Pentium is either a registered trademark or trademark of Intel Corporation in the U.S. and/or other countries. Adobe and Acrobat are trademarks of Adobe Systems Incorporated. All other trademarks are the property of their respective owners.

USE OF THIS PRODUCT IS SUBJECT TO CERTAIN RESTRICTIONS AND LIMITATIONS OF WARRANTY UNDER THE LICENSE AGREEMENT CONTAINED HEREIN.

Introduction

*“Calculus” is the Latin word for a stone which was used for “reckoning,”
in other words, for “calculation.”*

It has often been said that “Great minds think alike,” and when it comes to the development of calculus, this adage certainly holds true. In the mid-17th century, two of the greatest minds of the time both “invented” calculus. Gottfried Wilhelm Leibniz (1646-1716), a German philosopher whose genius made him an expert in nearly every subject (law, religion, philosophy, literature, politics, science, history, and mathematics, among others) is credited with laying the groundwork for calculus, as is Sir Isaac Newton (1642-1727), an English mathematician and astronomer who formulated the laws of gravity, basic theories of light, thermodynamics and hydrodynamics, and constructed the first modern, reflecting telescope. Although Leibniz invented calculus after Newton, Newton did not publish any papers about calculus until many years after Leibniz, so today we consider both men the originators of calculus.

Calculus is the branch of mathematics that deals with the effect on a function of an infinitesimal—very small—change. It enables us to analyze and predict physical phenomenon. If we want to find the minimum or maximum values of something—for example, the maximum profit one can obtain by changing the unit price of what one sells or the maximum weight a spaceship can carry as it travels to the moon and back—we would use calculus. This branch of mathematics gives us the tools to figure out the slope of a curve and it enables us to determine the rate of change when we compare two things. Calculus is widely used by scientists to determine rates of change and rates of growth. It is also commonly used in such fields as population growth analysis and traffic prediction and control. It also has many applications in everyday life in business, medicine, and even in sports.

Teach Yourself Calculus helps you learn this branch of mathematics right at your own computer. The program is divided into 12 interactive learning chapters with 79 lessons in all. You will begin with a review of functions and graphs, continue with gradients and slopes, move on to differentiation, and then learn the concepts of maxima and minima.

As you study calculus from this CD-ROM, remember that you are always in control—you can move at your own pace and repeat the lessons and exercises as many times as you wish until you fully grasp the concepts. So let’s get started—it’s time to *Teach Yourself Calculus!*

Minimum System and Hardware Requirements

Windows[®] 95, 98, Me

- 166 MHz Pentium processor or faster
- 32 MB RAM
- 8X CD-ROM drive
- 3 MB free hard disk space; 10 MB required if installing Adobe[®] Acrobat[®] Reader
- 800 x 600, High Color (16-bit) display
- Windows-compatible sound card
- Windows-compatible mouse

Windows[®] 2000 Professional or Windows[®] XP

- Pentium II processor or faster
- 128 MB RAM
- 8X CD-ROM drive
- 3 MB free hard disk space; 10 MB required if installing Adobe[®] Acrobat[®] Reader
- 800 x 600, High Color (16-bit) display
- Windows-compatible sound card
- Windows-compatible mouse

Macintosh[®]

- Minimum 180 MHz Power PC processor
- Mac OS 8.6 – 9.2.2
- 32 MB RAM
- 8X CD-ROM drive
- 3 MB free hard disk space; 10 MB required if installing Adobe[®] Acrobat[®] Reader
- Thousands of colors display

Installation Instructions

Windows®

Mind Power™ Math: Teach Yourself Calculus runs from your hard drive, but you must have the CD in the drive. To complete the installation, 3 MB is required on your hard drive to store some program files. Close all other programs and applications before installing. The setup program will also allow you to register this product electronically via modem, fax, or regular mail.

These instructions assume that the AutoPlay feature of Windows is turned on.

1. Insert the *Mind Power™ Math: Teach Yourself Calculus* CD into the CD-ROM drive.
2. When the *Mind Power™ Math: Teach Yourself Calculus* window appears, click **Install**.
3. Follow the onscreen instructions until installation is complete. The setup program will place *Mind Power™ Math: Calculus* file icons in the Start menu under The Learning Company program group.
4. To start the program, make sure you have the CD in the drive and choose The Learning Company/*Mind Power™ Math: Calculus* icon from the Start menu.

Macintosh®

Mind Power™ Math: Teach Yourself Calculus runs from your hard drive, but you must have the CD in the drive. To complete the installation, 3 MB of space is required on your hard drive to store the program files. Close all other programs and applications before installing. The installer will also allow you to register this product electronically via modem, fax, or regular mail.

To set up and start the program:

1. Insert the *Mind Power™ Math: Teach Yourself Calculus* CD into the CD-ROM drive. Double-click on the launcher or main application icon.
2. Click on the Continue button after you read the license information. If you click on the Install button on the next screen, the program and all the required system files will be copied to your hard drive. Click on the Custom button to install just the system files (Sound Manager 3.1). The selected install option is described below the selection box and the hard drive requirements also appear on this screen.

3. Make your selection and follow the onscreen prompts until the installation is complete.
4. To start the program, double-click on the program icon on your hard drive. If you do not see the program icon, simply enlarge the window. Or, you can press the Option key, click on the Special menu, and select "Clean Up by Name" to reposition the icons within the window.

To start the program at any time after the initial installation:

The installer will create a folder called *Mind Power™ Math: Calculus* inside The Learning Company folder on your hard drive.

1. Insert the *Mind Power™ Math: Teach Yourself Calculus* CD in the CD-ROM drive.
2. Open the *Mind Power™ Math: Teach Yourself Calculus* folder on your hard drive and double-click on the program icon. If you do not see the program icon, follow the instructions detailed in Step 4 above.

The *Teach Yourself Calculus* Window

Once the software has been installed, several icons will appear on your screen.



To view a self-running demo of the software's features, double-click on the Guided Tour icon.



To run the program and begin learning calculus, double-click on the *Teach Yourself Calculus* icon.



To test your knowledge of the concepts you have learned, double-click on the Quiz icon.

Exiting the Program

There are several ways to quit the program. If you are at the Main Menu screen, click on the House icon to exit the software.

If the House icon is not visible—or if you prefer—you can use a keystroke combination:

- On Macintosh computers, press **Ctl/Q** to exit the program.
- On PCs and compatibles, press **ALT/F4** to exit the program.

To run the program and begin learning calculus, double-click the *Teach Yourself Calculus* icon.

The Course of Study

The *Teach Yourself Calculus* program contains 12 chapters that have been subdivided into 79 lessons. Below you will find a chapter-by-chapter overview of the entire course of study.

For a more detailed look at each of the chapters and lessons, go to the Main Menu and click **Interactive Learning** and then click on the purple button which appears to the left of the words “Table of Contents” (the third line from the bottom). To view the second screen of this Table of Contents, click on the down arrow which appears on the bottom left, above the word “Next.” To view a specific lesson within any of the chapters, click on the yellow button to the left of the name of the desired lesson.

Chapter 1 — Introduction to Functions

Starting with a review of some basic mathematical concepts—independent and dependent variables, constants, parameters, and functions—you will begin developing the tools for understanding functions. Some familiar examples will help you grasp these abstract concepts.

Chapter 2 — Overview of Graphs

The graph of a function is its pictorial representation. This helps us better understand its abstract mathematical description. In this chapter, you will practice graphing a function when you have its mathematical formula. You will also see how to define actual values of a function at different points using a given graph of the function.

Chapter 3 — Limits

Limit is the value that a function approaches when its argument gets closer and closer to a given value, without ever reaching that value. This is one of the most important concepts in calculus. Graphs will help you understand the concept of limits. You will learn rules that can be applied when calculating limits of more complicated functions.

Chapter 4 — The Rate of Change of a Function

The gradient is the slope of a graph of a function. In this chapter, you will see that the gradient of a function at a given point is actually the gradient of the tangent to the function at that point. This means that if you find the gradient of the tangent to a function at a given point, you will know the gradient of the function at that point—and this is our goal.

Chapter 5 — Derivatives: A First Glance

This chapter explains the derivative of a function. Using limit, you will define the derivative of a function and learn how the sign of the derivative affects the properties of a function. You also will calculate derivatives of some very basic functions. In future chapters, you will see how what you have learned can be applied in the analysis of a function.

Chapter 6 — Differentiation

Once you understand what a derivative is and the importance of finding the derivative, you need to learn the rules of Differentiation. Here you will learn how to derive a more complicated function by knowing the derivatives of its “simple” parts. You also will learn how to derive a function which is the sum of a number of functions, or a function which is a product of two functions. Additionally, you will learn what happens with the derivative of a function when you multiply the function by a constant. You also will learn how to derive the quotient of two functions. These rules will make your studies much easier later on.

Chapter 7 — The Chain Rule

In this chapter, the function is derived layer-by-layer—like peeling an onion—to ultimately find the derivative for the composition of a function. In mathematics, this is known as the Chain Rule. By using the Chain Rule, complicated expressions, which may seem intimidating at first, become easier to work with.

Chapter 8 — Applications of Differentiation

This is the chapter where you can put into practice what you’ve learned thus far. Using calculus, you can now answer questions such as:

1. At what price should you sell a product to get the maximum profit?
2. What is the most economical way to build a pool?

The problem, in most cases, is to relate mathematics to reality. To find the optimum value is a simple problem, as you will see at the completion of your studies.

Chapter 9 — Derivatives of Trigonometric Functions

Trigonometric functions are used when you want to connect angular quantities to linear quantities. These functions are also necessary in physics, when, for example, you want to describe the creation of sounds or electromagnetism. Since trigonometric functions behave differently than functions we have discussed thus far, we will focus on them separately in this chapter.

Chapter 10 — Introduction to Exponential Functions

To help you understand the concept of an exponential function, consider this example. In a laboratory—or in the body—there are microbes that double themselves each generation. If you begin with two microbes, after a short period of time as they continue to reproduce, you will have millions of microbes. Another example, perhaps more meaningful, is the amount of money that will collect in your savings account over time when the bank pays a certain rate of interest. These are exponential functions.

Chapter 11 — Introduction to Logarithmic Functions

Perhaps the best-known logarithmic function is the Richter scale, which measures the force of an earthquake on a logarithmic scale. This chapter focuses on logarithmic functions.

Chapter 12 — Summary

Now it's time to apply the knowledge you've learned throughout this program to solve some practical problems.

Let's Begin!

The Guided Tour

We recommend that before you begin using the software, you double-click on the Guided Tour icon to view the *Teach Yourself Calculus* self-running demo. This short presentation will help you become acquainted with the features of the program.

Should you need to exit the Tour before it has finished:

- Press **Cntl/Q** on Macintosh computers.
- Press **ALT/F4** on PCs and compatibles.

Enter and Sign-In Please!



PLEASE ENTER YOUR NAME:

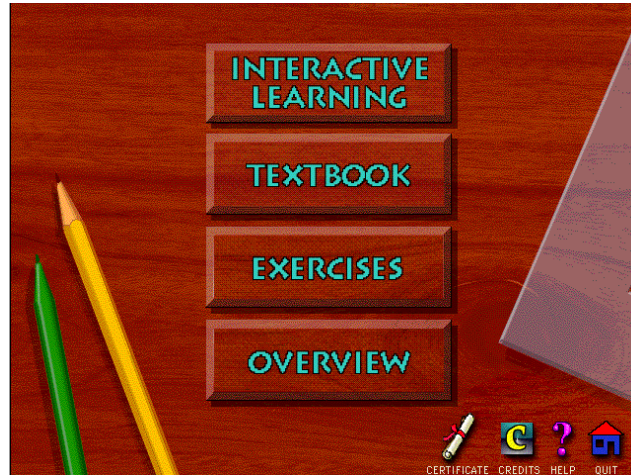
New Student

DONE

To start the program, double-click on the *Teach Yourself Calculus* icon. Each time you use the program, you will be asked to type your name in the sign-in box. Make certain you always enter the same name, spelled in the same way. This will enable *Teach Yourself Calculus* to keep track of your progress and take you directly to the place where you previously left off each time you return to the software.

The Main Menu

The *Teach Yourself Calculus* Main Menu is displayed below.



The four large buttons in the center of the screen represent the four main sections of the program. Clicking on any of these buttons displays the contents page for that section of the program. Below is a brief summary of each of these sections; more detailed descriptions are provided later in this guide.

INTERACTIVE LEARNING calls up the contents page for the 12 interactive learning chapters. This is the heart of the program where the multimedia learning activities are located.

TEXTBOOK takes you to the contents page for the complete *Teach Yourself Calculus* textbook written by P. Abbott. This book contains over 800 multimedia pages of text.

EXERCISES calls up the contents page for the exercises that test your knowledge of the concepts studied in the 12 interactive learning chapters.

OVERVIEW takes you to the contents page for the chapter overviews. The overviews provide brief summaries that highlight what will be learned.

On the bottom right of the Main Menu screen are four icons. Clicking on these icons does the following:

CERTIFICATE (the certificate scroll icon) displays your personalized Certificate of Success, showing your score and rating on the exercises you have completed. This Certificate can be printed.

Note: The maximum score for a given exercise is 100%. Incorrect answers, using clues, or using the REVEAL feature will lower your score. Exercise scoring is calculated for the current score only. Make sure that you have a printer selected in the Chooser.

CREDITS (the “C” icon) displays the names of the people who developed the program.

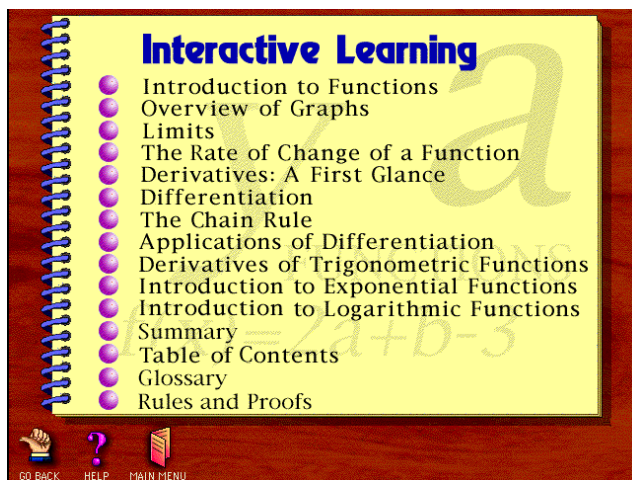
HELP (the question mark icon) displays a Help menu with information appropriate to the section of the program you currently are using.

QUIT (the “house” icon) allows you to exit the program.

Interactive Learning

Interactive Learning Contents Page

Clicking on the Interactive Learning button on the Main menu calls up the contents page for the 12 multimedia chapters in *Teach Yourself Calculus*. Let’s become familiar with how to navigate the software and the various features you can access from this screen.



There are several buttons and icons on this screen:

- Clicking on the purple button to the left of a chapter name will start the interactive learning lessons for that specific chapter. (More about this later.)
- Clicking on the pointing thumb (Go Back icon) will return you to the previous screen.
- Clicking on question mark (Help icon) will display the help screen for the contents page.
- Clicking on the book (Main Menu icon) will take you to the Main menu. From here you can move into other parts of the program or click on the House icon to exit the software.

Detailed Table of Contents

From the Interactive Learning contents page, you can access a more detailed Table of Contents that provides specific information about all of the lessons in each of the chapters. Click on the purple button to the left of the words Table of Contents on the third line from the bottom of the Interactive Learning contents page to access this screen.

Table of Contents

CHAPTER 1: Introduction to Functions

- 1.1 Opening
- 1.2 Variables and Constants
- 1.3 Independent and Dependent Variables
- 1.4 Variables and Parameters
- 1.5 Parameters and Functions
- 1.6 Variables and Parameters
- 1.7 Example
- 1.8 Definition of a Function
- 1.9 Notation of a Function
- 1.10 Functions of More than One Variable
- 1.11 More Practice with Functions
- 1.12 Summary of Chapter 1

CHAPTER 2: Overview of Graphs

- 2.1 Graph of a Function
- 2.2 Try It Yourself
- 2.3 Identifying a Function

CHAPTER 3: Limits

- 3.1 Opening
- 3.2 Limit of a Continuous Function
- 3.3 Infinite Limits
- 3.4 Limit of a Function of the Form $\frac{0}{0}$
- 3.5 A Remarkable Limit $\lim_{x \rightarrow 0} \frac{\sin x}{x}$
- 3.6 Theorems on Limits

CHAPTER 4: The Rate of Change of a Function

- 4.1 Introduction
- 4.2 Functions of the First Order Gradient
- 4.3 The Physical Meaning of Gradient
- 4.4 General Functions
- 4.5 The Meaning of Changing Gradient
- 4.6 The Gradient of a Given Point
- 4.7 Another Look at Gradient
- 4.8 The Sign of the Gradient
- 4.9 Summary of Chapter 4

CHAPTER 5: Derivatives-A First Glance

- 5.1 Reminder-The Gradient Between Two Points
- 5.2 Reminder-The Gradient at a Point
- 5.3 Differentiation
- 5.4 Derivative of a First Order Function
- 5.5 Derivative
- 5.6 Derivative of $f(x)=x^3$
- 5.7 When the Power is Negative
- 5.8 Increasing and Decreasing Functions
- 5.9 Conclusion
- 5.10 Rules of Exponentiation
- 5.11 Summary of Chapter 5

CHAPTER 6: Differentiation

- 6.1 Rules for Differentiation
- 6.2 A Function Multiplied by a Constant
- 6.3 An Example of When the Gradient Does Not Change
- 6.4 Differentiation of a Sum
- 6.5 Differentiation of a Product

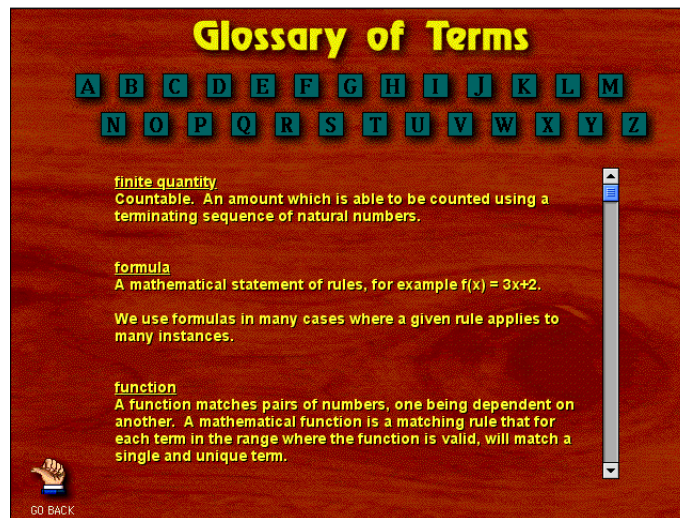
GO BACK NEXT

- To view the second page of this detailed Table of Contents, click on the green arrow above the word “Next” on the bottom left of the screen. To return to the first page of this Table of Contents, click on the green arrow that appears above the word “Previous” on the bottom left of the screen.
- To view a specific lesson listed in this Table of Contents, click on the yellow button to the left of the lesson’s name.
- To return to the Interactive Learning contents page, click on the pointing thumb (Go Back icon) on the bottom left of the screen.

The Glossary

Teach Yourself Calculus has a comprehensive glossary that explains more than 75 mathematical terms.

- To access the glossary, click on the purple button to the left of the word “Glossary” which appears on the next to the last line of the Interactive Learning contents page.
- To find the meaning of a specific term, click on the letter button at the top of the glossary screen which corresponds to the first letter of the word you seek. Then, use the scroll bar on the right to move up or down through the list of terms.
- To return to the Interactive Learning contents page, click on the pointing thumb (Go Back icon) on the bottom left of the screen.



Rules and Proofs

From the Interactive Learning contents page, you also can view a listing of the Rules and Proofs taught in the *Teach Yourself Calculus* program.

- To view the Interactive Learning page where a specific rule or proof is explained, click on the purple button to the left of the name of the rule or proof.
- The number to the right of the rule or proof is the chapter and page number where that rule or proof is introduced in the Interactive Learning pages.
- To return to the Interactive Learning contents page, click on the pointing thumb (Go Back icon) on the bottom left of the screen.
- To return to the Main menu, click on the book (Main Menu icon). From here you can move into other parts of the program or click on the House icon to exit the software.

Rules and Proofs	
Rules	
● Rules Related to Limits	3.6
● Rules for Exponentiation	5.10
● Rules for Differentiation	6.7
● Deriving Trigonometric Functions	9.6
Proofs	
● Finding the Limit	5.3
● Deriving Higher Order Functions	5.6
● Differentiation of a Sum	6.4
● Differentiation of a Product	6.5

GO BACK HELP MAIN MENU

Interactive Learning Pages

The Interactive Learning pages are the heart of the program. These are where you will be receiving your multimedia instruction in calculus. By listening to the narrator and watching the on-screen animations and videos, you will be presented with the course material to help you learn the concepts and skills.

Clicking on the purple button to the left of a chapter name on the Interactive Learning contents page will take you to the first multimedia lesson in that chapter.

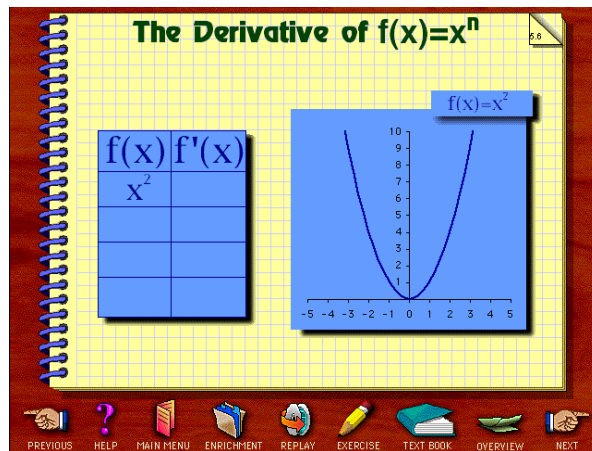
Interactive Learning	
● Introduction to Functions	
● Overview of Graphs	
● Limits	
● The Rate of Change of a Function	
● Derivatives: A First Glance	
● Differentiation	
● The Chain Rule	
● Applications of Differentiation	
● Derivatives of Trigonometric Functions	
● Introduction to Exponential Functions	
● Introduction to Logarithmic Functions	
● Summary	
● Table of Contents	
● Glossary	
● Rules and Proofs	

GO BACK HELP MAIN MENU

A sample Interactive Learning page appears on the following page. Note that in the upper right of the screen, the page flap is turned down. Clicking on the page number on this flap will take you to the detailed Table of Contents mentioned earlier in this guide. From this Table of Contents, you can view the list of lessons for each chapter.

- To view a specific lesson listed in this Table of Contents, click on the yellow button to the left of the lesson's title.
- To return to the Interactive Learning page you previously were viewing, click on the pointing thumb (Go Back) icon.

Along the bottom of each Interactive Learning page is a horizontal row of icons. These icons help you navigate the software and access the features of the program. Not all icons appear on all pages; some icons (such as Enrichment and Exercise) represent special features that are only available for certain lessons. You are already familiar with some of these icons, but let's introduce them all, from left to right:



PREVIOUS PAGE (hand pointing left icon) takes you back one page in the interactive learning.

HELP (question mark icon) accesses a help screen with information appropriate to the section of the program you currently are using.

MAIN MENU (book icon) returns you to the Main Menu screen from which you can move into other parts of the program or click on the House icon to exit the software.

ENRICHMENT (folder icon) provides further in-depth learning and exercises that correspond to the information you presently are studying. (Not all learning pages have enrichment screens.)

REPLAY (tape reel icon) lets you repeat the learning page you just viewed. Remember, you can replay the learning pages as many times as you wish.

EXERCISE (pencil icon) provides the opportunity for you to practice what you have learned. Not all learning pages have exercises associated with them; the narrator will tell you when these are available. Your progress on the exercise will automatically be recorded on your Certificate of Success. (You can view this certificate by clicking on the Certificate icon on the Main Menu screen.)

TEXTBOOK (textbook icon) takes you to the section of the textbook that corresponds with the chapter you are studying presently.

OVERVIEW (pages icon) presents a brief summary of the chapter you are presently studying.

NEXT (hand pointing right icon) moves you ahead one page in the Interactive Learning. This icon will blink to signal that it is time to move along to the next learning page.

Remember, You Are Always in Control!

As you move through the interactive learning pages, remember that with *Teach Yourself Calculus*, you are always in control:

- If you want to repeat the page you just viewed, click on the **REPLAY** icon.
- If you want to review an earlier page in the chapter, click on the **PREVIOUS** icon.
- If you want additional information about the concepts being presented, click on the **TEXTBOOK** icon.

Need a Break?

If you want to stop the narration so that you can think about what you've just learned or take a short break, press the **SPACEBAR**. Press the **SPACEBAR** again to continue.

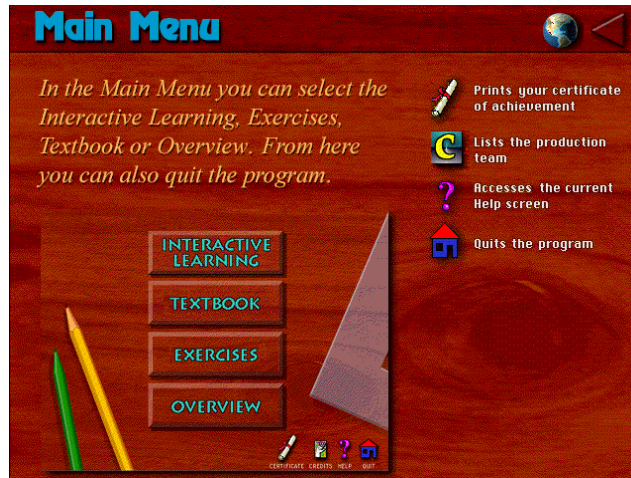
When it's time to leave the program, remember to exit the software properly. Either:

- Click on the Book (Main Menu icon) and then click on the House (Exit) icon.
- Use the appropriate keystroke combination:
 - Type **Cntl/Q** on Macintosh computers.
 - Type **ALT/F4** on PCs and compatibles.

By exiting the program in one of these ways, *Teach Yourself Calculus* will keep track of where you left off so that when you sign in the next time you use the program, you will automatically be taken to the appropriate place in your studies.

Need Help?

When you click on the Help icon (question mark), the software will display a help screen appropriate to the area of the program you presently are using. For example, if you click on the Help icon while viewing the Main menu, the Main Menu help screen will be displayed.



In the upper right-hand corner of the Help screen there are two icons: a globe and a triangle.

- Clicking on the triangle will return you to the screen you were at before clicking on Help.
- Clicking on the globe will display the entire hierarchy of Help screens for *Teach Yourself Calculus*. Each of the nine boxes on this hierarchy chart is a button; clicking on a box will display the Help screen for that topic.

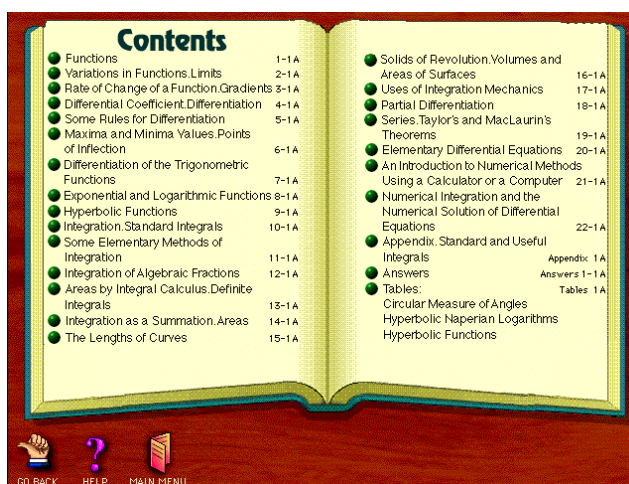


The Textbook

Clicking on the Textbook button on the Main Menu takes you to the “Teach Yourself Calculus” textbook written by P. Abbott. The *Teach Yourself Calculus* program covers the first eight chapters in this textbook. The entire book is more than 800 multimedia pages, which is equivalent to 250 printed pages. Because this is an electronic text, you can set electronic bookmarks for future reference, click on Hotwords for their definitions, and print pages from the textbook for study away from the computer.

The Contents page for the Textbook is shown below.

- Clicking on the green button to the left of a chapter name will take you to that chapter in the Textbook.
- Clicking on the pointing thumb (Go Back icon) will return you to the screen you were previously viewing.
- Clicking on the question mark (Help icon) will display the Help screen for the textbook contents page.
- Clicking on the book (Main Menu icon) will return you to the Main Menu. From here you can move into other parts of the program or click on the house icon to exit the software.



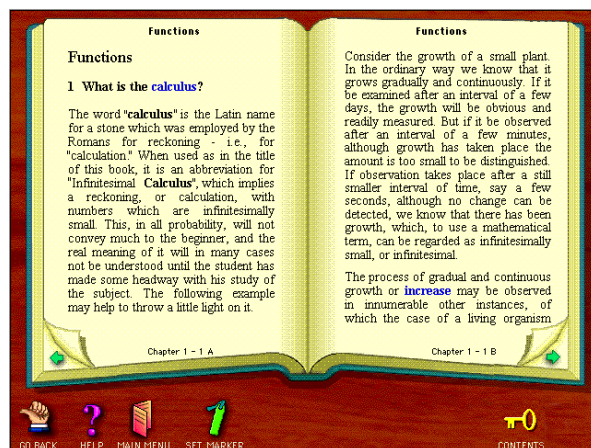
Contents	
● Functions	1-1A
● Variations in Functions, Limits	2-1A
● Rate of Change of a Function, Gradients	3-1A
● Differential Coefficient, Differentiation	4-1A
● Some Rules for Differentiation	5-1A
● Maxima and Minima, Values, Points of Inflection	6-1A
● Differentiation of the Trigonometric Functions	7-1A
● Exponential and Logarithmic Functions	8-1A
● Hyperbolic Functions	9-1A
● Integration, Standard Integrals	10-1A
● Some Elementary Methods of Integration	11-1A
● Integration of Algebraic Fractions	12-1A
● Areas by Integral Calculus, Definite Integrals	13-1A
● Integration as a Summation, Areas	14-1A
● The Lengths of Curves	15-1A
● Solids of Revolution, Volumes and Areas of Surfaces	16-1A
● Uses of Integration Mechanics	17-1A
● Partial Differentiation	18-1A
● Series, Taylor's and MacLaurin's Theorems	19-1A
● Elementary Differential Equations	20-1A
● An Introduction to Numerical Methods Using a Calculator or a Computer	21-1A
● Numerical Integration and the Numerical Solution of Differential Equations	22-1A
● Appendix, Standard and Useful Integrals	Appendix 1A
● Answers	Answers 1-1A
● Tables:	Tables 1A
● Circular Measure of Angles	
● Hyperbolic Napierian Logarithms	
● Hyperbolic Functions	

Many chapters in the textbook contain practice exercises. The answers to these exercises can be found at the back of the book. Clicking on the button to the left of Answers (the next to last item in the Table of Contents) will take you to the answers for the exercises.

Inside the Textbook

Two pages from the textbook are shown below. In the lower corners of the textbook pages are green arrows—on the left-hand page the arrow points to the left, on the right-hand page the arrow points to the right.

- To move forward through the textbook, click on the right arrow beneath the right-hand page flap.
- To move backwards in the textbook, click on the left arrow beneath the left-hand page flap.



Note the row of icons across the bottom of the screen beneath the textbook pages. You already are familiar with some of these icons, but we'll introduce them all, from left to right:

GO BACK (pointing thumb icon) returns you to the screen you were previously viewing. If, for example, you came to the textbook from the Interactive Learning pages, clicking on Go Back will return you to the Interactive Learning page you came from.

HELP (question mark icon) accesses the appropriate Help screen with information about the textbook.

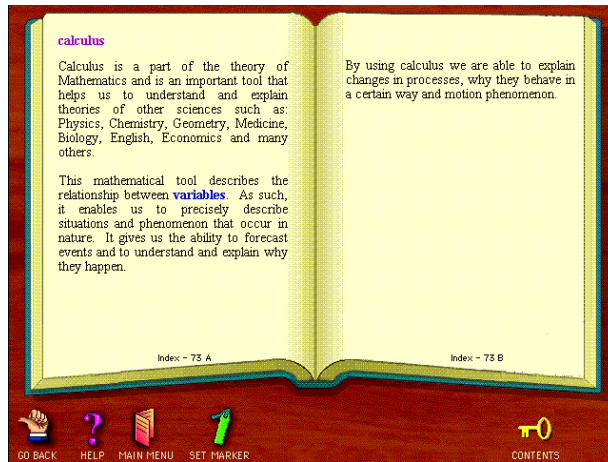
MAIN MENU (book icon) takes you to the Main Menu screen. From here you can move into other parts of the program or click on the House icon to exit the software.

SET MARKER (bookmark icon) enables you to place an electronic bookmark in the textbook so that you can return to that page quickly, just by clicking on the red bookmark. Up to three bookmarks can be set in the textbook. When you are on the page where a bookmark appears, the bookmark's tassel will become visible and the Delete Marker icon will be displayed. To remove the bookmark, click on this icon.

CONTENTS (key icon) takes you to the Table of Contents for the textbook.

“Hotwords”

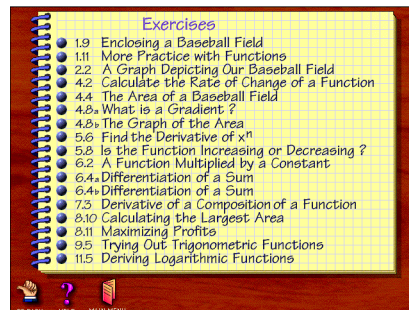
In the Textbook, many words appear in blue print. These are called “hotwords.” Clicking on a hotword will display a screen with a concise definition of that term. In the Textbook screen displayed on the previous page, the word “calculus” appears in blue, signifying that it is a hotword. Clicking on that word will display the following screen:



When you have finished reading the definition on the hotword screen, click on the Go Back (pointing thumb) icon to return to the Textbook screen on which the hotword appeared.

Exercises

Clicking on the Exercises button on the Main Menu displays a list of the 17 exercises found in the program. The chapter and lesson numbers appear to the left of the name of the exercise. Clicking on the blue button to the left of the exercise's name will take you to the screen where that exercise is located.



The Confirm, Clue, and Reveal Icons

Three additional icons appear on many of the exercise pages.



Click on the **CONFIRM** icon (game piece) after entering your answer to the exercise. This registers your answer with the program.



Click on the **CLUE** icon (puzzle piece) if you need a hint to help you solve a problem.



Click on the **REVEAL** icon (light bulb) if you really don't know the answer.

Certificate of Success

Your performance on the exercises will automatically be recorded on the Certificate of Success. This Certificate can be viewed by clicking on the Certificate icon at the bottom of the Main Menu screen. The Certificate also can be printed.

Teach Yourself Calculus 4/16/02

Certificate of Success

Presented to: New Student

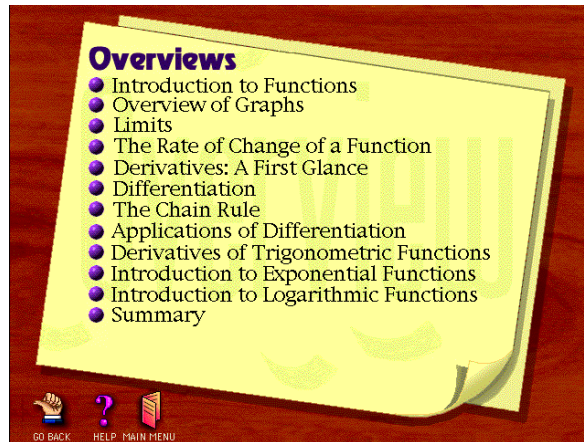
No.	Exercise	Score	Rating
1.9	Enclosing a baseball Field	_____	_____
1.11	More Practice with Functions	_____	_____
2.2	A Graph Describing Our Baseball Field	_____	_____
4.2	Calculate the Rate of Change of a Function	_____	_____
4.4	The Area of a Baseball Field	_____	_____
4.8a	What is the Gradient?	_____	_____
4.8b	The Graph of the Area	_____	_____
5.6	Solve the Derivative of x .	_____	_____
6.8	Is the Function Increasing or Decreasing?	_____	_____
6.2	A Function Multiplied by a Constant	_____	_____
6.4a	Differentiation of a Sum	_____	_____
6.4b	Differentiation of a Sum	_____	_____
7.3	Derivative of a Function of a Function	_____	_____
8.10	Calculating the Largest Area	_____	_____
8.11	Maximizing Profits	_____	_____
9.5	Trying out Trigonometric Functions	_____	_____
11.5	Deriving Logarithmic Functions	_____	_____

GO BACK PRINT

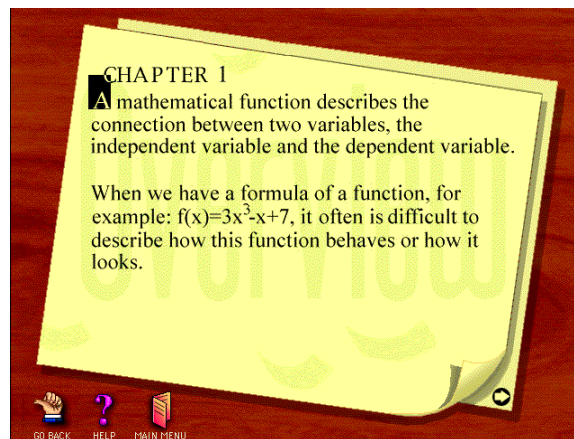
Overviews

Each chapter in *Teach Yourself Calculus* has an overview. Chapter overviews might be compared to “coming attractions” at the movies—they provide a brief summary of what’s to come, what you will be learning and how it can be applied to real life situations.

Clicking on the Overview button on the Main menu calls up the overviews contents page which lists the titles of the 12 chapters in *Teach Yourself Calculus*. To display an overview, click the purple button to the left of the chapter’s name.



You can read the Overviews screen along with the narrator. If two circular arrows appear on the bottom right corner of the screen, the overview continues on a second page. Clicking on this button will display the next page.

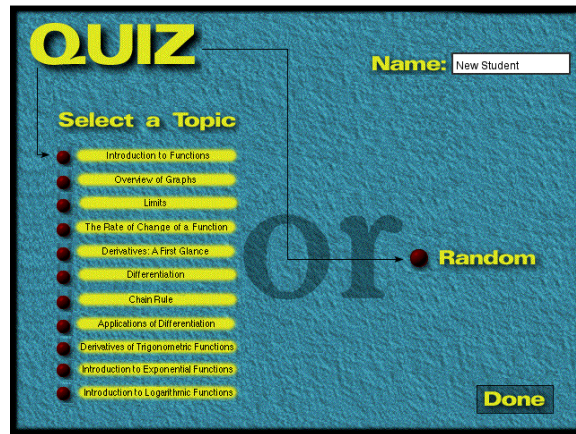


Before you begin studying an Interactive Learning chapter, we suggest that you read the overview for the chapter so that you will have a frame of reference for what you will be learning.

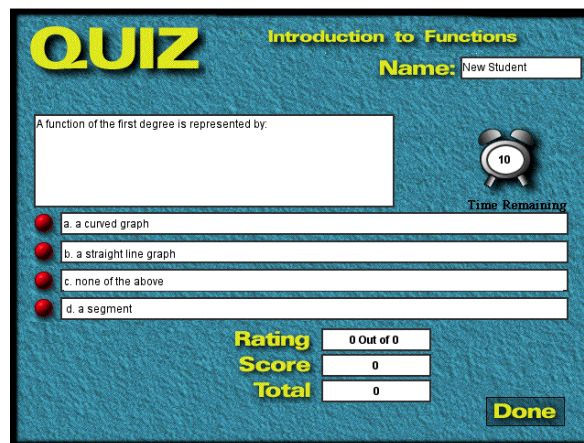
Note that the chapter overviews also can be accessed by clicking on the Overview icon (pages of paper) that appears at the bottom of the Interactive Learning screens.

Test Your Knowledge

Teach Yourself Calculus has a series of quiz questions to test your knowledge. This feature is located outside the regular program. Click on the Quiz icon in the *Teach Yourself Calculus* window to start the quiz.



The Quiz menu has 11 buttons along the left side—one for each of the Interactive Learning chapters in the program—as well as a Random button on the right. You decide whether you want to be quizzed on the content from a specific chapter or be quizzed randomly with questions from the entire *Teach Yourself Calculus* program. Once you choose how you want to be quizzed, the questions will begin appearing.



The quiz questions are multiple choice; you click on the button to the left of the statement that best answers the question. An alarm clock on the right side of the screen keeps track of your time. You have 20 seconds to answer each question. Should you fail to answer a question in the allotted time, you will be told that your time is up and then a new question will be displayed. The software automatically keeps track of your rating, score, and total.

- To return to the Quiz menu, click the Done button on the right.
- To try another quiz, select a topic or click on the Random button.
- To exit the Quiz feature, click the Done button on the Quiz menu screen.

Summary

Now that you know all of the features of the program, it's time to *Teach Yourself Calculus*. To make your learning experience more meaningful, we would like to offer a few suggestions.

Guided Tour

As already mentioned, we highly recommend that before you start using the program, you take a few minutes to view the Guided Tour. (Click on the “Guided Tour” icon.) This tour will help you become familiar with the features of the program.

Overview

Before you begin an Interactive Learning chapter, we suggest that you read the chapter overview. (Click on the Overview button on the Main menu.) Each overview highlights the information you will be learning in the chapter so that you will know what lies ahead as you move through the Interactive Learning pages.

Interactive Learning Pages

The information presented in each chapter builds from lesson to lesson, so it is important that you start at the beginning of the chapter and move sequentially through the pages. Remember that you are always in control:

- Click on the Replay icon if you would like to repeat the learning page you just viewed. You can replay the learning pages as many times as you wish.
- Click on the Previous icon to go back to an earlier page for review.
- Press the Space bar when you want to pause the narration and take a short break. (It will actually stop at the end of the current narration.) Press it again to resume.
- Don't forget to click on the Textbook icon to refer to the *Teach Yourself Calculus* textbook which contains additional explanations and exercises for each of the interactive learning chapters.

Glossary

If there is a special word or term with which you are not familiar, don't despair—look it up in the Glossary! The Glossary can be accessed from the Contents page that appears when you click on the Interactive Learning button on the Main menu.

Textbook

The textbook has several important electronic features:

- Words that appear in blue are hotwords. Clicking on a hotword displays a screen with a concise definition of the term.
- You can set up to three electronic bookmarks to mark important pages in the textbook.

Exercises

All of the exercises can be accessed directly from within the Interactive Learning pages; however, you also can get to them from the Exercises button on the Main menu. Remember that the software will be keeping track of your progress on the Certificate of Success.

Quizzes

Teach Yourself Calculus also has an additional bank of quiz questions. These are an excellent way to test your knowledge and review what you have learned. Double-click the Quiz icon in the *Teach Yourself Calculus* window to access this feature.

Technical Support

If you have questions about your *Mind Power™ Math* program, please refer to the Troubleshooting section. If you do not find an answer to your question, please visit The Learning Company Web site at <http://www.riverdeep.net/learningcompany/support> and click **Product Support**. Select the product name from the alphabetical list and check to see if the problem you are experiencing is listed among the FAQs. If you need to speak to a technical support representative, click **Contact Us** and scroll down to the Technical Support area for the appropriate phone number.

You may be asked to provide the following information:

- Your contact information (name and email address, plus phone or mailing address if you wish)
- Description of the problem you're having
- Product name and version number (The version number is often printed on the CD label.)
- Brand of computer
- Operating system (for example, Windows 98 or Mac® OS 8.6)
- Processor type and speed
- RAM memory (in MB or megabytes)
- Video card manufacturer
- Sound card manufacturer
- Printer type
- Hard disk space remaining
- Background programs (antivirus programs or screensavers)

Customer Support

For assistance with product orders, purchases, or refunds, please contact our Customer Support department by visiting The Learning Company Web site at:

<http://www.riverdeep.net/learningcompany/support>.

SATISFACTION GUARANTEED

If you are not completely satisfied with this product, The Learning Company will gladly refund your purchase price or provide a replacement product. Return the complete package to us at The Learning Company, Dock Door #9, 120 Hidden Lake Circle, Duncan, SC 29334, within 30 days of purchase. Include a copy of the sales receipt, packing slip, or invoice showing the store name and location. Please enclose an explanation for the return and specify the replacement title, if applicable. Allow 4-6 weeks for refund or replacement. Limit 1 per household. Dealers, wholesalers, and their immediate families are not eligible.