

**INTELLIGENT TUTOR™ PRACTICE AND REVIEW SERIES**

**INTRODUCTORY CALCULUS**

**(c) 1988-2016 Intelligent Software, Inc.**

**Deluxe Recordkeeping Edition - Windows Version**

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# **Installation Instructions**

## **If you are installing from the MathTutor CD-ROM**

- (a) Insert the MathTutor CD-ROM into your CD-ROM drive. The MathTutor Installation Launcher menu will appear.
- (b) On the menu, in the section labeled "Step 1 - Select Version", click "Deluxe Versions". Then, in the section labeled "Step 2 - Select Title", click the program you wish to install.
- (c) Click the "Install" button.
- (d) Enter the installation password for the program you have selected, then click OK. NOTE: The installation passwords can be found on the back cover of the CD-ROM sleeve case.
- (e) Follow the instructions on the screen. When the installation is complete you will return to the MathTutor Installation Launcher menu. You may then install another program, or quit.

## **If you are downloading the program from the MathTutor website**

- (a) Visit the download page of our Web site:  
<http://www.mathtutor.com/download.html>
- (b) Scroll down to the section titled "Downloads - Deluxe Versions". In the box with the heading "Practice and Review Series" click the "Program" link to the right of "Introductory Calculus".
- (c) If a dialog box appears and asks if you wish to "Save" or "Run", select "Save". Be sure to note where the installation file is saved.
- (d) Double click the installation file you just downloaded. The installation process will begin. Follow the instructions on the screen.

## **System Requirements**

\* Windows XP, Windows Vista, Windows 7/8, Windows 10

## Starting a MathTutor Program

1. Click the **Start** button on the Windows taskbar. The Start menu opens.
2. Choose **Programs**. The Programs folder opens.
3. Choose **Intelligent Tutor**.
4. Click the program you wish to run. The program will then begin, and the title screen will appear. Click the title screen to continue.
5. The **Student Login** screen will appear. To keep records for this session, select a name and click **Login**. If you prefer to not keep records for this session, click **Skip Login**.
6. Use the main menu to select "Practice Mode" or "Test Mode".

Practice Mode allows you to select a particular problem type area, and to practice problems of that type.

Test Mode allows you to test your problem solving skills in a range of problem type areas.

# **Welcome to Introductory Calculus**

Welcome to INTRODUCTORY CALCULUS in the INTELLIGENT TUTOR™ Practice and Review Series!

INTRODUCTORY CALCULUS will help students develop problem solving skills, and reinforce their understanding of basic concepts and principles. Designed by educators, it provides a comprehensive range of drill and practice exercises that will provide challenging practice for students, even after being used many times.

INTRODUCTORY CALCULUS can be used in two ways: Practice Mode and Test Mode.

Practice Mode allows you to select a problem type and to practice solving problems of that type. After each problem, you are told if your answer was correct or incorrect. You are then given these options: to re-do the problem; to see an explanation of the problem; to try another problem of the same type; to return to the Practice Menu to select another problem type; or, to return to the Main Menu.

Test Mode allows you to take sample tests. Following the test you will see your performance on each problem, as well as an overall evaluation of your skill level.

If you are just beginning your study of calculus, or simply wish to improve your understanding of basic concepts and principles, you should also consider INTRODUCTORY CALCULUS in our Concepts and Skills Series. It makes extensive use of graphics and animation to teach the concepts and ideas of math.

## **The Recordkeeping System**

This program's recordkeeping system gives teachers a powerful tool for monitoring each student's use of the program. Before it can be used, the teacher must create a student list of one or more names. The instructions for doing this, and for using the other features of the recordkeeping system, are found starting on page 12.

# Problem Types Covered

The 30 problem types contained in INTRODUCTORY CALCULUS are divided into the following four problem set areas:

- \* REVIEW OF ALGEBRA
- \* FUNCTIONS
- \* DIFFERENTIAL CALCULUS
- \* INTEGRAL CALCULUS

## **REVIEW OF ALGEBRA**

1. Concepts / Definitions
2. Right Triangle Trigonometry
3. Elementary Identities I
4. Signs of Functions
5. Quadrants of Angles
6. Radian/Degree Measure

## **FUNCTIONS**

7. Evaluation and Inverses
8. Coordinate System
9. Graphs of Straight Lines
10. Graphs of Conics
11. Graphs of Logs and Exponents
12. Asymptotic Curves
13. Delta Notation
14. Average Rates of Change

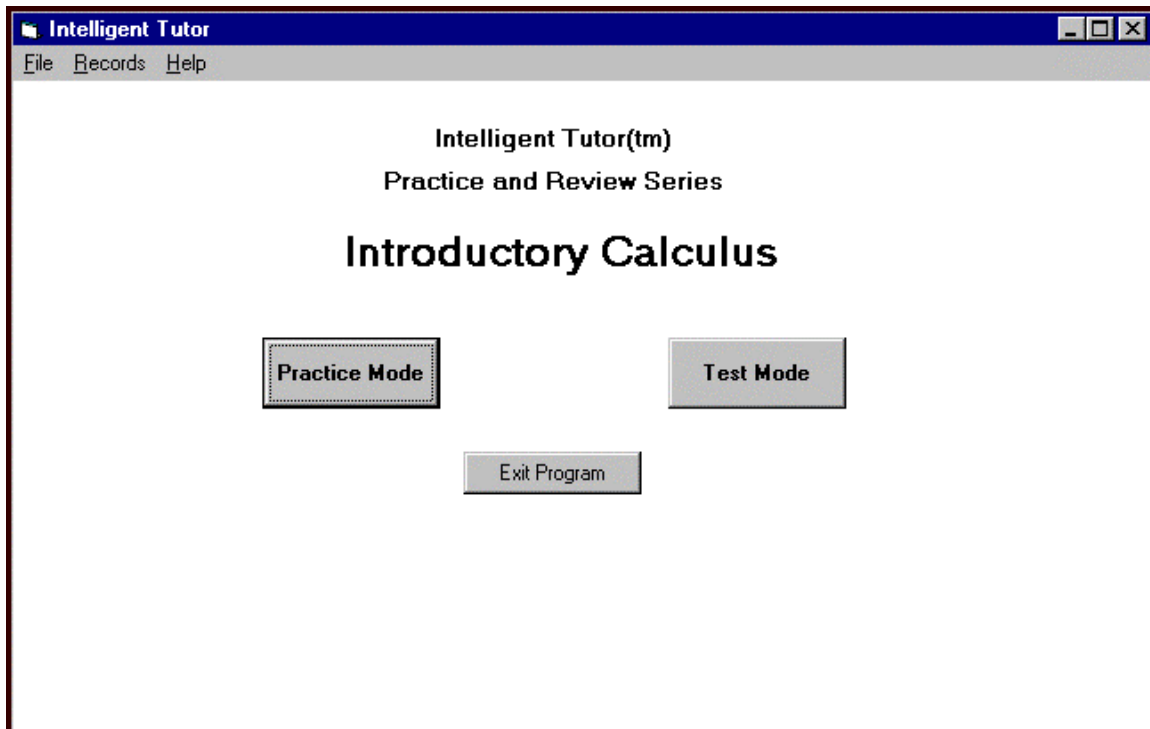
## **DIFFERENTIAL CALCULUS**

15. Function Properties
16. Differentiation I
17. Differentiation II
18. Maxima and Minima
19. Word Problems: Brooms
20. Implicit Differentiation
21. L'Hospital's Rule
22. Differentiable Functions
23. Areas and Perimeters

## **INTEGRAL CALCULUS**

24. Indefinite Integrals I
25. Indefinite Integrals II
26. Indefinite Integrals
27. Advanced Integration Techniques
28. Bounded Area: Curves
29. Bounded Area: Straight Lines
30. Solids of Revolution

# Using the Program



The main program menu (shown above) is your take-off point for using the two main parts of the program - Practice Mode and Test Mode.

Click **Practice Mode** to see the Practice Mode Menu, which is described on the following page.

Click **Test Mode** to see the Test Menu, which is described on page 10.

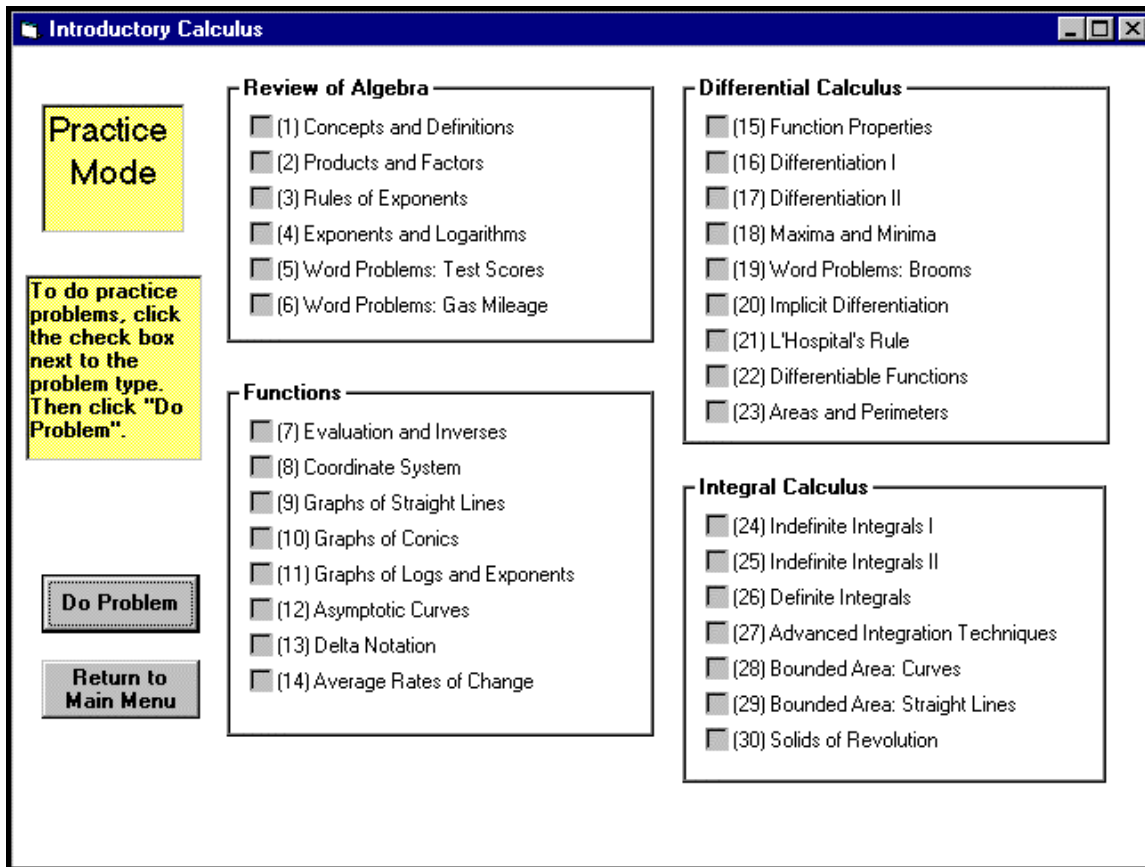
Click **Exit Program** to end the program.

As you use the program, you may wish to see a summary of how well you are doing in the current session. The RECORDS menu allows you to see a summary of your performance in the current session. It is explained later in this manual.

## Regarding the Taskbar...

Some users may notice that the bottom of some of the screens in this program is partly covered by the Windows taskbar. If you notice this problem, you may minimize the Taskbar while using the program. To minimize the Taskbar, move the mouse pointer to the top edge of the Taskbar. When the mouse pointer becomes a two-headed arrow, press the left mouse button, drag downward, and release the button.

# Practice Mode



If you selected "Practice Mode" on the main menu you will see the Practice Mode Menu shown above.

This menu allows you to select a problem type to practice. Each of the 30 problem types contains thousands of random variations, assuring that the program will continue to provide new and challenging problems even after being used many times.

The Practice Mode menu groups the problems into four problem set areas, making it easier for you to find particular kinds of problems that you may wish to practice.

To begin practice in problem solving, click the check box to the left of the problem type description. Then click the "Do Problem" button.

After trying a problem you'll be told immediately if your answer was correct or incorrect. If you like, you'll be able to re-do the problem. You'll also be able to see an explanation of the solution to the problem.

## Practice Mode (continued)

The screenshot shows a window titled "Introductory Calculus" with a menu bar containing "File" and "Help". The main content area is titled "PROBLEM TYPE 16" and contains the following text:

Find the first derivative of:  
 $f(x) = [8x^3+11x^5]+[12x^4+9x^6]$ .

Below the problem are five multiple-choice options, each in a grey box:

- (A)  $10x+20x^3+9+36x^2$
- (B)  $18x^2+49x^6+40x^4$
- (C)  $18x^2+12x^5+20x^4+88x^7$
- (D)  $48x^3+54x^5+24x^2+55x^4$
- (E) None of the above

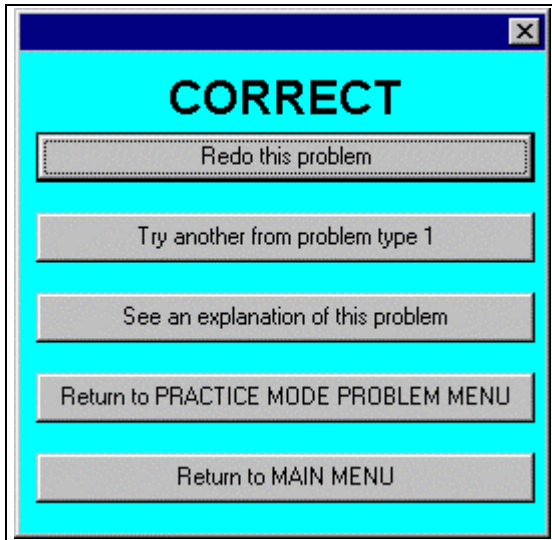
At the bottom of the window, there is a cyan instruction box that says "Select the best answer and click to the right" and five buttons labeled A, B, C, D, and E.

When the program presents a problem for you to solve, such as you see in the screen above, the answer choices will be displayed in a multiple choice format. To select an answer, click the box that contains the answer, or click one of the answer choice buttons at the bottom of the screen.

The program will respond by telling you if your answer was correct or incorrect. The options available to you at this point are shown on the following page.



## Practice Mode (continued)



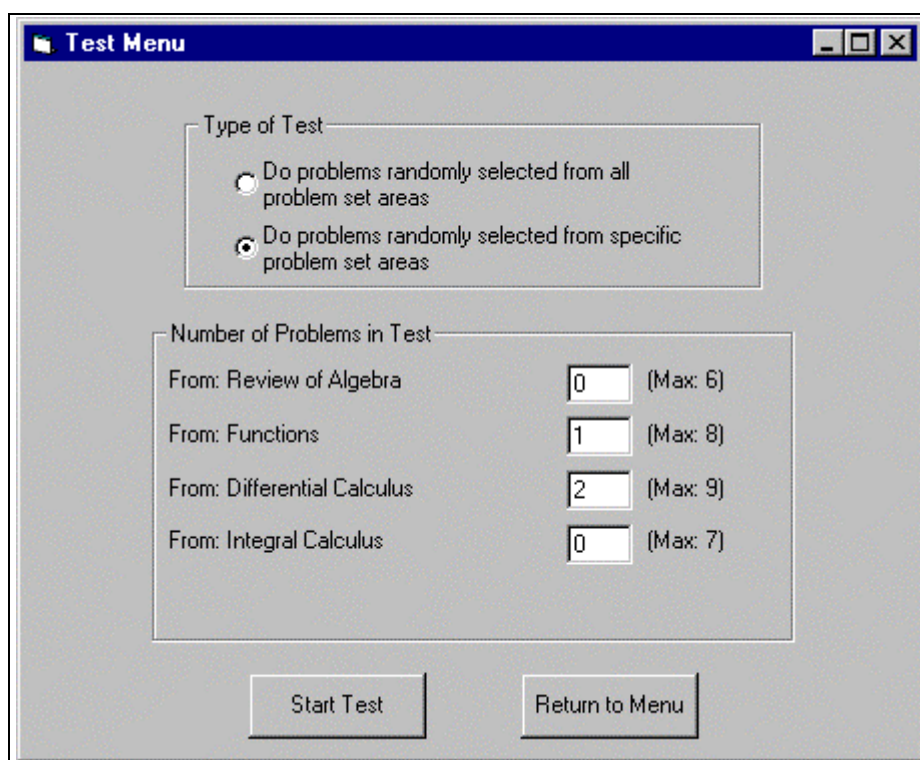
After doing a problem, select one of the options shown to the left.

Most of the choices are self-explanatory.

If you did not solve the problem correctly, and would like to see how it can be solved, select the third option choice: “**See an explanation of this problem**”.

Trying to solve problems is one of the best ways for you to build your math skills, so we encourage you to spend time practicing problems.

## Test Mode



The screenshot shows a window titled "Test Menu" with a blue title bar. Inside the window, there are two main sections. The first section, "Type of Test", contains two radio buttons: the first is unselected and labeled "Do problems randomly selected from all problem set areas"; the second is selected and labeled "Do problems randomly selected from specific problem set areas". The second section, "Number of Problems in Test", contains four rows, each with a label, a text input field, and a maximum value in parentheses: "From: Review of Algebra" with a field containing "0" and "(Max: 6)"; "From: Functions" with a field containing "1" and "(Max: 8)"; "From: Differential Calculus" with a field containing "2" and "(Max: 9)"; and "From: Integral Calculus" with a field containing "0" and "(Max: 7)". At the bottom of the window are two buttons: "Start Test" and "Return to Menu".

If you selected “Test Mode” on the main menu you will see the Test Menu shown above. Test mode allows you to take sample tests, and to see both a detailed evaluation of your performance and an overall evaluation of your skills.

Before you begin a test, you must specify two things. First, you must specify if you want your test to contain problems from all problem sets, or from selected problem sets. Second, you must specify the number of problems in your test. (If your test is from selected problem sets you must specify the number of problems you wish to do in each problem set.)

In the Test Menu screen above, you can see that we have specified that our test will consist of one problem from the problem set “Functions”, and two problems from “Differential Calculus”. When the program begins the test, one problem type will be randomly selected from the eight problem types contained in “Functions”, and one problem will be generated for this problem type. Likewise, two problem types will be randomly selected from the nine problem types contained in “Differential Calculus”, and one problem will be generated for each of the two types.

To begin your test, click “Start Test”.

## Test Mode (continued)

After completing the test, the program will show you the results in two separate screens.

First, you will see your performance on each of the test problems, as shown below. For each test problem you are shown the problem type number, the problem type description, your answer, the correct answer, and whether your answer was right or wrong. Your overall percentage correct is shown in a summary box at the bottom of the screen.

Test Prob	Problem Type #	Problem Type Description	Your Answer	Correct Answer	Correct?
1	10	Graphs of Conics	C	D	no
2	23	Areas and Perimeters	D	D	yes
3	16	Differentiation I	D	D	yes

**Test Summary:**

Number of problems:	3
Number correct:	2
Percent correct:	66

Proceed

## Test Mode (continued)

Next, you will see an evaluation of your performance by skill category, as shown below. Each skill category represents a group of problem types that require a certain skill. The skill categories are explained in the table at the bottom of the screen. For example, the skill category “general concepts” consists of problem types 1, 8, 12, 13, 15, 21, and 28.

The screenshot shows a window titled "Introductory Calculus" with a yellow background. At the top center is a grey box with the text "Analysis of Test Results". Below this is a table with four columns: "Skill Category", "# of Probs in Test", "Number Correct", and "Pct. Correct". The table contains six rows of data. Below the table is a blue heading "Each skill category consists of various problem types, as follows:" followed by a list of skill categories and their corresponding problem types. At the bottom are two grey buttons: "Return to Main Menu" and "Show Test Results Again".

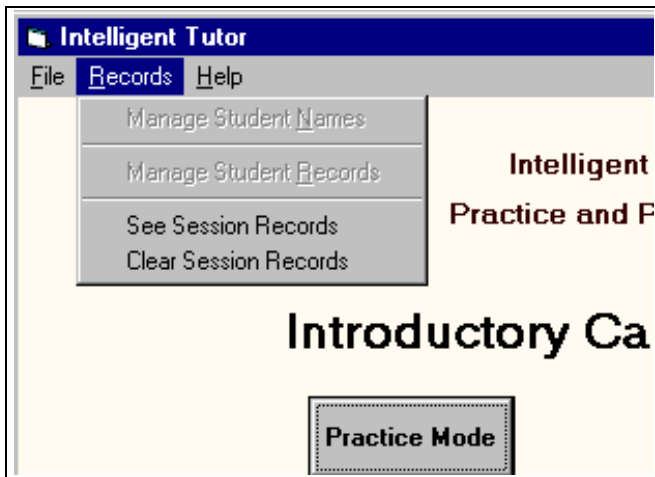
Skill Category	# of Probs in Test	Number Correct	Pct. Correct
General concepts	0	0	—
Advanced algebra	0	0	—
Functions	1	0	0
Differentiation skills	2	2	100
Integration skills	0	0	—
Reading comprehension	0	0	—

Each skill category consists of various problem types, as follows:

General concepts.....	Problem Types 1,8,12,13,15,21,28
Advanced algebra.....	Problem Types 2,3,4,5,6
Functions.....	Problem Types 7,8,9,10,11,12,13,14
Differentiation skills.....	Problem Types 16,17,18,19,20,21,22,23
Integration skills.....	Problem Types 24,25,26,27,28,29,30
Reading comprehension.....	Problem Types 5,6,14,15,18,22

Return to Main Menu      Show Test Results Again

## Looking at Your Performance in the Current Session



The **RECORDS** menu allows you to see your performance during the current session.

Select "See Session Records" to see your performance.

Select "Clear Session Records" to erase this sessions records.

The screen below shows how the current session's records are displayed.

The screenshot shows the 'Introductory Calculus' window with a 'Session Results' table. The table has columns for 'Problem Type #', 'Problem Type Description', 'Number Attempted', 'Number Correct', and 'Percent Correct'. The data is as follows:

Problem Type #	Problem Type Description	Number Attempted	Number Correct	Percent Correct
Test	Various problem types	3	2	66
16	Differentiation I	1	1	100

A 'Return to Main Menu' button is located at the bottom of the window.

# The Recordkeeping System

## Overview

This program's recordkeeping system provides teachers with a complete history of each student's use of the program. Here's how it works. As students use the program, the following information is automatically stored in the **Student Records File**:

- Student Name
- Date
- Name of problem type
- Number of problems attempted
- Number of problems answered correctly
- Number of minutes spent in the problem type area

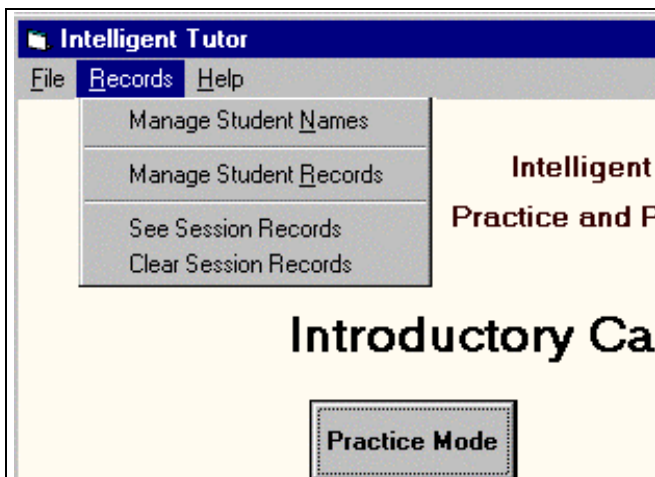
The teacher can use the recordkeeping system at any time to view this information. The teacher will see a list of the problem types each student has practiced, the dates on which they used the program, the number of minutes spent in each problem type area, and the student's performance in solving problems in each problem type area. This information can be viewed for one student, or for all students. The information can be displayed on screen, or on a printed report.

**NOTE:** This program and its recordkeeping system are not designed for network or site license use. It is designed for use on a single computer. If you wish to use this program on more than one computer you may purchase additional copies of the program at a special reduced priced ("lab disks"), or you may purchase a site license.

The recordkeeping system can handle up to 50 students.

## Using the Recordkeeping System

The recordkeeping system is available through the **RECORDS** menu. There are two options: **Manage Student Names** and **Manage Student Records**.



**NOTE:** Please don't confuse the Recordkeeping System with "Session Records".

"Session Records" show a student how well he or she is doing during the current session, but are not stored after the session has ended.

# The Recordkeeping System (continued)

## Manage Student Names

In order to maintain student records, you must first create a **Student List** of one or more names. A student list is needed to enable students to select their name from the list and to “log in”.

The **Manage Student Names** screen allows you to add and delete student names, and to edit student names.

To add a student: Click the **Add a Student** button. Then type the name of the student and click **OK**.

To delete a student: Click the student’s name in the Student List. Then click the **Delete a Student** button.

To edit a student name: Click the student’s name in the Student List. Then click the **Edit Student Name** button. Type the new name and click **OK**.

To delete all student names: Click the **Erase All Students** button.

## Manage Student Records

The **Manage Student Records** screen allows you to display on the screen, or print, records for an individual student or for all students. You may also erase the records of a single student, or all students.

To display the records for all students: Click the **Display Records for All Students** button.

To print the records for all students: Click the **Print Records for All Students** button.

To erase the records for all students: Click the **Erase Records for All Students** button.

To display the records for a single student: Click the student’s name in the Student List. Then click the **Display Records for Selected Student** button.

## The Recordkeeping System (continued)

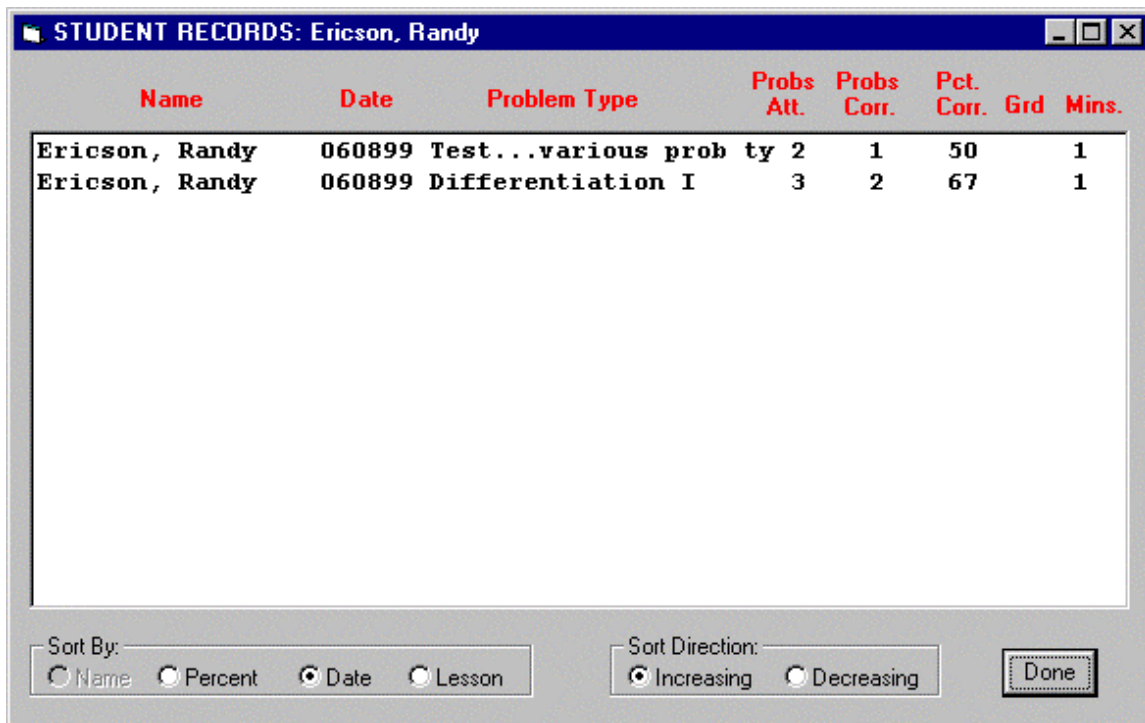
To print the records for a single student: Click the student's name in the Student List. Then click the **Print Records for Selected Student** button.

To erase the records for a single student: Click the student's name in the Student List. Then click the **Erase Records for Selected Student** button.

The illustration below shows how records are displayed on the screen for a single student.

Notice the sort choices shown at the bottom of the display. They enable you to sort the records by date, by problem type description, or by percent correct.

When you are done viewing the records, click **Done** to return to the **Manage Student Records** screen.



The screenshot shows a window titled "STUDENT RECORDS: Ericson, Randy". Inside the window is a table with the following data:

Name	Date	Problem Type	Probs Att.	Probs Corr.	Pct. Corr.	Grd	Mins.
Ericson, Randy	060899	Test...various prob ty 2	2	1	50		1
Ericson, Randy	060899	Differentiation I	3	2	67		1

At the bottom of the window, there are two control groups. The first is labeled "Sort By:" and contains four radio buttons: "Name", "Percent", "Date" (which is selected), and "Lesson". The second is labeled "Sort Direction:" and contains two radio buttons: "Increasing" (which is selected) and "Decreasing". To the right of these controls is a button labeled "Done".