



The COW Student/User Handbook

An Introduction to Calculus on the Web

Calculus on the Web (COW) is an Internet utility for learning and practicing calculus. It was designed at Temple University by two members of the Mathematics Department faculty, Gerardo Mendoza and Dan Reich. Here you will find a wealth of information about the important ideas of calculus, but remember: there is no substitute for attending a class and working with your instructor. Work with COW will

- supplement your classroom learning
- help you understand basic mathematical principles and methods
- strengthen your algebraic and analytical skills
- develop your grasp of the geometry of basic functions
- help you review and prepare for examinations.

It is intended to be profitable and enjoyable, and accompanied by your lectures, textbook readings or doing other written work, will help you build a strong mathematical base.

Access to the COW

Access is provided by most internet browsers, although there is some variation in the appearance of the COW screens depending on the browser and computer being used. Netscape was used for the design, so most screens look quite reasonable on that browser. The internet address, or URL to use for COW is :

<http://www.math.temple.edu/~cow/>

Getting Around the COW Library

When you sit down at your computer and start the operating system (for example, Windows or Macintosh), open your browser and type in the COW URL. You will see the COW Home Page; perhaps you just came from there. It has a number of buttons, and some input boxes for logging in.

The COW is organized into books, chapters and sections, much like a calculus text. For example, Calculus Book I contains the material normally covered in a first semester calculus course. To open this book, click with your mouse on the corresponding button (the button says 1 on it). The chapters in this book are similar to those in almost any calculus textbook; to open a chapter, click on its button.

This is how you navigate through the cow library to go somewhere, or take an action of any sort: click on a button. There are also some sample materials and some explanatory pages you can see by going back to the Overview page.

- **Don't use the Netscape buttons like the "Back" button to navigate, because that can confuse the record-keeping component of the COW.**

During navigation, you can see the contents of a chapter or section by clicking on **Index**. When you do this, there will be a slight delay while the table of contents is compiled.

The navigation and actions of a COW session are fairly clear and self-explanatory. Just play with it for a while, and you will understand how to make it do what you want.

Working with the COW

The COW system is a collection of interactive calculus modules. Each module provides the opportunity to learn and practice an individual technique or idea, or to experiment and study the variation of a particular structure. Algebra, graphics and numerical calculation are all part of the COW's repertoire.

For example, in a typical exercise module, a problem of a particular type is posed. An explanation is available, and a place to type in your answer after you have solved it in the usual way, with pencil, paper and calculator. When you submit your answer it is checked by the COW to see if it is completely, or in some cases partially, correct. After a moment of reflection, the COW will respond with a message telling you what was right or wrong about your answer, and giving you another chance if you got it wrong. In many cases, graphics are available when you submit the correct answer; in others, appropriate graphics are part of the posing of the problem.

The general philosophy of the COW system is that you have many opportunities to try a problem. Wrong answers are recorded, but a problem will be graded as correct if you eventually get it right, even after several incorrect attempts. So it pays to keep working on a problem. On the other hand, once you have gotten the right answer for a particular problem and recorded it, you cannot have the problem count in your grade a second time by resubmitting this answer. In other words,

- [you can get a problem wrong many times, but right only once!](#)

Of course, the module you are working in will have many problems of that type, so tackle another one.

Within a module, the problems are color-coded according to difficulty level: [blue](#) for easy ones, [purple](#) for slightly harder ones and [red](#) for the most difficult ones. In some of the modules the first few problems are ungraded. Ungraded problems are coded in black; right answers on these cannot count towards your grade.

Login, Recording and Grading

The COW is freely available on the internet to anyone - students, mathematics scholars, visitors serious or casual - but only registered students can log in for a session in which their work will be recorded and graded. COW has the built-in ability to keep track of your work and calculate a sort of homework grade. This grade may be used by your instructor to evaluate your COW homework. If COW work is a required part of your course, you have to make sure that this recording is turned on. You will have a personal COW password; recording is turned on by entering your last name and password at the bottom of the COW Home Page.

You are free to choose a password, but it must be installed at the beginning of the semester. Any password you are currently using for a computer account or other purpose is irrelevant and unsuitable for use in the COW.

- [If you are an enrolled student in a class registered with the COW, you should make up a new password, an easy to remember one, that is strictly for COW use, and install it.](#)

Password instructions:

At your opening session, click on the Password button on the Home Page to create a password; in subsequent sessions, you can use the same button to change to a new password or to be reminded of your current password. Remember, you choose your own password:

- the only restriction is that you cannot use your name, or a password that is currently in use.

Once you know your password, go back to the Home Page to log in for a recorded session; enter your last name and password and then get to work by clicking on a book. And as a registered student with a password, you can go directly to the last section you were working on by clicking the return button.

If you are logged in for a recorded session, a reminder in red will show at the top left of each screen during the session. Visitors may use the COW facility but may not have their work recorded and graded.

Logging in for a recorded session, step-by step:

1. Start your browser and enter the URL: <http://www.math.temple.edu/~cow> .
2. You will see the Home Page. At the bottom is the login section.
3. Enter your last name, and your password if you have one and remember it.
 - If you have a password and have forgotten it, click on the Password button.
 - If you have not chosen a password yet, click on the Password button.
 - The Password Creator will then take over, giving you a chance to identify yourself as a registered student by entering your Social Security Number.
 - Once you are validated, you will be able to create or change a password, or be reminded of your current one.
 - You can then click on the Work button to begin your work session. You will be taken to the Home Page; enter your last name and password.
4. Click on the Calculus Book I button to work on a homework assignment, do practice exercises or review or just to play around.
5. From the list of chapters in this book, choose a chapter, then a section, and then a specific module to work on. Problems or other activities will now be presented.
6. When you have completed the assignment you are working on, or are through using COW for the moment, exit the browser to terminate your work session.

Homework

Your instructor may be assigning regular COW homework to your class. You can view your homework assignments by clicking on the Homework button which appears whenever you open a book (for example, by clicking on the Calculus I Book button) or when you click on the Chapter button to see the list of chapters in a book. The procedure is as follows:

1. Click on the Homework button.
2. Check the boxes for the assignments you want to view, and click on the View the assignment button.
3. The next screen shows a list of modules and problems for each assignment that you checked. When you are ready, click on the Done button or on Chapter to go to work.

When you open any module, the homework problems from that module are listed at the top of the screen showing the introductory first problem.

Each homework assignment has a due date. The work you do on an assignment must be completed by the end of that day. When an assignment is scored by the COW and reported to your instructor, only work done on or before the due date will be counted.

- If you need additional time to work on a particular assignment, you must contact your instructor to arrange for a special due date for that assignment. You must have good reasons and your instructor's agreement for such an extension of time.

Grade Reports

When a homework assignment is graded by the COW, all the work you do on problems included in the assignment (while logged in, of course) is compiled, and a score for the assignment is determined. You can view a report on any specific assignment via the "Score the assignment" button. The report will tell you which problems you

- got right on or before the due date for the assignment
- got right, but only after the due date
- have not yet gotten right

This is how it works:

1. Open a book to see a list of chapters, and click on the Homework button.
2. Select some assignments and click on "Score the assignment".
3. If you wish to see a report on another assignment, click on the "Homework" button at the bottom of the screen. If not, click "Done" to go back to work.

Overview

When you work with the COW, you will make your calculations by hand as usual, but you will be entering your answers into the computer. There are certain simple rules you must follow when typing in numbers or formulas. For example, how do you type in an exponent, such as "x squared" or "square root of 3"? The answers:

- For "x squared" type x^2 ... the ^ indicates exponents.
- For "square root of 3" type $\text{sqrt}(3)$ or $3^{(1/2)}$.

Answers to questions like these can be found by clicking on Overview on the COW Home Page. Here you will find some help in typing formulas and a chance to practice. You will also find some easy sample modules that you can look at to get used to the COW's style.