WeBWorK

I have added links on the course webpage to problem sets that can be worked online. These are on the WeBWorK mathematics homework site, which is hosted on a UMM server at http://webwork.morris.umn.edu/webwork2/.

You should **avoid using WeBWorK at noon, 6:00 pm, and midnight**, since the server will be restarted at these times and it's possible you might lose work for the question you are working on. Just log off (remember, WeBWorK saves whatever you have already completed!) for 5 minutes each side of these times just to be safe.

You are using WeBWorK so you can get some additional feedback on homework problems. This is not meant to replace the homework problems from the text already identified on the course syllabus, but as another opportunity to work on practice problems where you can get immediate feedback on whether or not you have the correct answer.

- Each student has their own account, with a username given by their UMM email account name

  username@morris.umn.edu

  So if my email account was trixie09@morris.umn.edu, my username is trixie09. The password for your account is initially set to your student ID, and you should change it once you log in.
- When you login, you will be presented with different problem sets you can work on. Each student will get their own individualized problem set, which is different from any other problem set another student in the class has.

  You can print off hardcopies of the problem sets if you like, and work on them away from the computer. Or you can work on some scratch paper and complete them while you are still right in front of the computer. In either case, to get credit for a correct answer you must enter your answer online! The computer system will keep track of your progress, so neither our TA nor myself will be grading these problems.
- Each problem set will consist of a few problems. You can complete some of them and return later to complete the rest, and the computer will remember the ones you have already completed. You can submit answers to a problem again and again, until you get it correct–but guessing is not a good strategy!
- Some problems allow you to earn partial credit. You will always retain the highest partial credit you have earned from all attempts, so if you try again and do worse you aren't penalized.
- Each problem set has a due date, after which you will not be able to get any credit for completing those problem sets. When a problem set closes, the answers will be available to you.
- If you have difficulty getting WeBWorK to accept an answer you are sure is correct, send me an email from within WeBWorK–the email will show me which problem you are working on and allow me to see what you have tried.
- If WeBWorK seems to be impossibly slow or you have other trouble with the system, send me an email and go work on some of your other homework.

WeBWorK Syntax

Mathematical Symbols Available In WeBWorK

- + Addition
- − Subtraction
- * Multiplication can also be indicated by a space or juxtaposition, e.g. 2x, 2 x or 2*x, also 2(3+4).
- / Division
- ^ or ** You can use either ^ or ** for exponentiation, e.g. 3^2 or 3**2
- () You can also use square brackets, [ ], and braces, , for grouping, e.g. [1+2]/[3(4+5)]
- $\sqrt{x}$ is given by sqrt(x)
- $\ln(x)$ is given by ln(x)
- $|x|$ is given by abs(x)
- $\cos x$ is given by cos(x) (and uses radian measure)

Syntax for entering expressions

- Be careful entering expressions just as you would be careful entering expressions in a calculator.
- Sometimes using the * symbol to indicate mutiplication makes things easier to read. For example (1+2)*(3+4) and (1+2)(3+4) are both valid. So are 3*4 and 3 4 (3 space 4, not 34) but using a * makes things clearer.
- Use ('s and)'s to make your meaning clear. You can also use ['s and]'s and 's and 's.
- Don't enter 2/4+5 (which is 5.5) when you really want 2/(4+5) (which is 2/9).
- Don't enter 2/3*4 (which is 8/3) when you really want 2/(3*4) (which is 2/12).
- Entering big quotients with square brackets, e.g. [1+2+3+4]/[5+6+7+8], is a good practice.
- Be careful when entering functions. It's always good practice to use parentheses when entering functions. Write sin(t) instead of sint or sin t. But WeBWorK is smart enought to accept sin t or even sint. However, sin 2t is interpreted as sin(2)t, i.e. (sin(2))*t. Be careful.
- Do not enter sin^2t even though you might see something like this written in a text book. Mathematically speaking sin^2t is shorthand for (sin(t))^2(the square of sin of t) and must be entered this way. (You can enter it as sin(t)^2 or even sint^2, but don't try such things unless you really understand the precedence of operations. The "sin" operation has highest precedence, so it is performed first, using the next token (i.e. t) as an argument. Then the result is squared.)
- Is -5^2 positive or negative? It's negative. This is because the square operation is done before the negative sign is applied. Use (-5)^2 if you want to square negative 5.
- When in doubt use parentheses!!! :-)
- The complete rules for the precedence of operations, in addition to the above, are
  - Multiplications and divisions are performed left to right: 2/3*4 = (2/3)*4 = 8/3.
  - Additions and subtractions are performed left to right: 1-2+3 = (1-2)+3 = 2.
  - Exponents are taken right to left: 2^3^4 = 2^(3^4) = 2^81 = a big number.
- Use the "Preview Button" to see exactly how your entry looks. E.g. to tell the difference between 1+2/3+4 and [1+2]/[3+4] click the "Preview Button".

Mathematical Constants Available In WeBWorK

- pi This gives 3.14159265358979, e.g. cos(pi) is −1
- e This gives 2.71828182845905, e.g. ln(e*2) is 1 + ln(2)