

Assignment 0.1 INTRODUCTION TO WEBWORK due 12/29/2012 at 08:00am PST

1. (1 pt) Library/Rochester/set0/prob3.pg

This problem demonstrates a WeBWorK Matching question.

Match the statements defined below with the letters labeling their equivalent expressions.

You must get all of the answers correct to receive credit.

- ___1. x is any real number
 ___2. x is greater than 5
 ___3. x is less than 5
 ___4. x is less than or equal to 5
 ___5. The distance from x to 5 is more than 3
- A. $5 < x$
 B. $x < 5$
 C. $|x - 5| > 3$
 D. $-\infty < x < \infty$
 E. $x \leq 5$

For this problem WeBWorK only tells you that all your answers are correct or that at least one is wrong. This makes the problem harder and is usually used only for T/F and matching questions. The idea is to encourage you to think rather than to just try guessing.

If you are having trouble reading the mathematics on the screen, this means that you are using "text" mode. If you are using Netscape or MSIE then you can get an easier to read version of the equations by returning to the problem list page (use the button at the top of this page) and choosing "formatted-text" or "typeset" instead of "text". Sometimes there is a 15-20 second delay in viewing a problem in "typeset" mode the first time.

2. (1 pt) Library/Rochester/set0/prob1a.pg

This problem demonstrates how you enter function answers into WeBWorK.

First enter the function $\sin x$. When entering the function, you should enter $\sin(x)$, but WeBWorK will also accept $\sin x$ or even $\sin x$. If you remember your trig identities, $\sin(x) = -\cos(x + \pi/2)$ and WeBWorK will accept this or any other function equal to $\sin(x)$, e.g. $\sin(x) + \sin(x)**2 + \cos(x)**2 - 1$

We said you should enter $\sin(x)$ even though WeBWorK will also accept $\sin x$ or even $\sin x$ because you are less likely to make a mistake. Try entering $\sin(2x)$ without the parentheses and you may be surprised at what you get. Use the Preview button to see what you get. WeBWorK will evaluate functions (such as \sin) before doing anything else, so $\sin 2x$ means first apply \sin which gives $\sin(2)$ and then multiply by x . Try it.

Now enter the function $2 \cos t$. Note this is a function of t and not x . Try entering $2 \cos x$ and see what happens.

3. (1 pt) Library/ASU-topics/setIntroduction_to_WeBWorK/prob1a.pg

This problem demonstrates how you enter function answers into WeBWorK.

First enter the function $\log x$. (If you have not encountered this particular function yet, you will soon.) When entering the function, you should enter $\log(x)$, but WeBWorK will also accept $\log x$ or even $\log x$. WeBWorK will accept this or any other function equal to $\log(x)$, e.g. $\log(x) + \log(10^x) - x$.

It is better to enter $\log(x)$ even though WeBWorK will also accept $\log x$ or even $\log x$ because you are less likely to make a mistake. Try entering $\log(2x)$ without the parentheses and you may be surprised at what you get. Use the Preview button to see what you get. WeBWorK will evaluate functions (such as \log) before doing anything else, so $\log 2x$ means first apply \log which gives $\log(2)$ and then multiply by x . Try it.

Now enter the function $2\sqrt{t}$ (as $2\text{sqrt}(t)$). Note this is a function of t and not x . Try entering $2\text{sqrt}(x)$ and see what happens.

4. (1 pt) UCR/Rochester_set0_intro_to_webwork_prob1a.pg

This problem demonstrates how you enter numerical answers into WeBWorK.

Evaluate the expression $3(-10)(4 - 6 - 2(10))$: _____

In the case above you need to enter a number, since we're testing whether you can multiply out these numbers. (You can use a calculator if you want.)

For most problems, you will be able to get WeBWorK to do some of the work for you. For example

Calculate $(-10) * (4)$: _____

The asterisk is what most computers use to denote multiplication and you can use this with WeBWorK. But WeBWorK will also allow you to use a space to denote multiplication. You can either $-10 * 4$ or -40 or even $-10 4$. All will work. Try them.

Now try calculating the sine of 45 degrees (that's sine of π over 4 in radians and numerically $\sin(\pi/4)$ equals 0.707106781186547 or, more precisely, $1/\sqrt{2}$). You can enter this as $\sin(\pi/4)$, as $\sin(3.1415926/4)$, as $1/\text{sqrt}(2)$, as $2**(-.5)$, etc. This is because WeBWorK knows about functions like \sin and sqrt (square root). (Note: exponents can be indicated by either a "caret" or $**$). Try it.

$\sin(\pi/4) =$ _____

Here's the **list of the functions** which WeBWorK understands. WeBWorK ALWAYS uses radian mode for trig functions.

You can also use juxtaposition to denote multiplication. E.g. enter $2\sin(3\pi/2)$. You can enter this as $2*\sin(3*\pi/2)$ or more simply as $2\sin(3\pi/2)$. Try it:

Sometimes you need to use $()$'s to make your meaning clear. E.g. $1/2+3$ is 3.5, but $1/(2+3)$ is .2 Why? Try entering both and use the "Preview" button below to see the difference. In addition to $()$'s, you can also use $[\]$'s and \prime 's.

You can always try to enter answers and let WeBWorK do the calculating. WeBWorK will tell you if the problem requires a strict numerical answer. The way we use WeBWorK in this class there is no penalty for getting an answer wrong. What counts is that you get the answer right eventually (before the due date). For complicated answers, you should use the "Preview" button to check for syntax errors and also to check that the answer you enter is really what you think it is.

5. (1 pt) Library/Rochester/set0/set00prob03.pg

This problem will help you learn the rules of precedence, that is, the order in which mathematical operations are performed. You can use either parentheses $()$, square brackets $[\]$, or curly braces $\{ \}$ if you want to change the normal way operations work.

So first let us review the normal way operations are performed.

The rules are simple. Exponentiation is always done before multiplication and division, and multiplication and division are always done before addition and subtraction. (Mathematically we say exponentiation takes precedence over multiplication and division, etc.). For example what is $1+2*3$?

and what is $2 \cdot 3^2$?

Now sometime you want to force things to be done in a different way. This is what parentheses are used for. The rule is: whatever is enclosed in parentheses is done before anything else (and things in the innermost parentheses are done first).

For example how do you enter

$$\frac{1 + \sin(3)}{2 + \tan(4)} \quad ?$$

Hint: this is a good place to use $[\]$'s and also to use the "Preview" button.

Here are some more examples:

$$(1+3)9 = 36, (2*3)**2 = 6**2 = 36, 3**(2*2) = 3**4 = 81, (2+3)**2 = 5**2 = 25, 3**(2+2) = 3**4 = 81$$

(Here we have used $**$ to denote exponentiation and you can

also use this instead of a "caret" if you want). Try entering some of these and use the "Preview" button to see the result. The "correct" result for this answer blank is 36, but by using the "Preview" button, you can enter whatever you want and use WebWork as a hand calculator.

There is one other thing to be careful of. Multiplication and division have the same precedence and there are no universal rules as to which should be done first. For example, what does $2/3*4$ mean? (Note that $/$ is the "division symbol", which is usually written as a line with two dots, but unfortunately, this "line with two dots" symbol is not on computer keyboards. Don't think of $/$ as the horizontal line in a fraction. Ask yourself what $1/2/2$ should mean.) WebWork and most other computers read things from left to right. That is, $2/3*4$ means $(2/3)*4$ or $8/3$, rather than $2/12$. Some computers may do operations from right to left. If you want $2/(3*4) = 2/12$, you have to use parentheses. The same thing happens with addition and subtraction. $1-3+2 = 0$ but $1-(3+2) = -4$. This is one case where using parentheses even if they are not needed might be a good idea, e.g. write $(2/3)*4$ even though you could write $2/3*4$. This is also a case where previewing your answer can save you a lot of grief since you will be able to see what you entered.

Enter $2/3*4$ and use the Preview button to see what you get.

6. (1 pt) Library/ASU-topics/setIntroduction.to.WeBWorK/prob3.pg

This problem demonstrates WeBWorK questions where the answer is a list of numbers or an interval.

Enter the first three numbers of the form n^2 where n is a positive integer, as a comma separated list.

You could have entered your answer as "1, 4, 9" (without the quotes), or as "4, 1, 9", or as " $2^2, 1^2, 3^2$ ". The order of the numbers does not matter, and you can still let WeBWorK evaluate expressions for you.

Now we will enter a few intervals from the real line. WeBWorK can handle standard interval notation. In each case, we will describe the set in a couple of ways, and then show you how to enter it. Let's start with real numbers satisfying $2 \leq x < 5$. The usual interval notation for this is $[2, 5)$.

Enter it just as shown: _____

Note, you can follow the usual WeBWorK conventions when entering the numbers in the interval, so you could also enter $[\log(100), 2**2 + 1)$. Try it. Previewing your answer can help here too if you are having WeBWorK evaluate your answer.

With intervals, there is a difference between square brackets $[\]$ (which mean to include the end point) and parentheses $()$ (which mean to not include the end point), and you will need to get them right to have the interval correct.

If we want to enter an interval where one side is unbounded, such as the real numbers greater than 3, we would normally write $(3, \infty)$. Since computer keyboards do not come with an infinity symbol, we just write out the word *infinity*. So, enter (3, infinity).

If we had wanted $-\infty$, we would type *-infinity* instead

Finally, sometimes intervals come in more than one piece. For example, the inequality $x^2 \geq 25$ is satisfied with $x \geq 5$ and also when $x \leq -5$. This would be normally written as the union of two intervals:

$$(-\infty, -5] \cup [5, \infty)$$

To type this into WeBWorK, we just use a capital U for the union symbol: (-infinity, -5] U [5, infinity)

When using unions of intervals, the order of the smaller intervals does not matter, so you could also enter [5, infinity) U (-infinity, -5].

Be aware that if you enter intervals which overlap, such as $[2, 10) \cup (7, 15)$, WeBWorK will expect you to simplify it into

a single interval, in this case $[2, 15)$.

7. (1 pt) Library/ma122DB/set0/prob5.pg

This problem demonstrates a WeBWorK question that requires you to enter a number or a fraction.

Evaluate the expression $\frac{|137-338|}{|-8|}$. Give you answer in decimal notation correct to three decimal places or give your answer as a fraction.

Now that you have finished you can use the "Prob. List" button at the top of the page to return to the problem list page. You'll see that the problems you have done have been labeled as correct or incorrect, so you can go back and do problems you skipped or couldn't get right the first time. Once you have done a problem correctly it is ALWAYS listed as correct even if you go back and do it incorrectly later. This means you can use WeBWorK to review course material without any danger of changing your grade.