How to Enter Answers in WeBWorK

Addition	+	a+b gives $a+b$
Subtraction	-	a-b gives $a-b$
Multiplication	*	a*b gives ab

Multiplication may also be indicated by a space or juxtaposition, such as 2x, 2 x, 2*x, or 2(x+y).

Division	/	a/b gives $\frac{a}{b}$
Exponents	^ or **	a^b gives a^b as does a**b
Parentheses, brackets, etc		(...), [...], {...}

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 multiplication 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 an explicit multiplication symbol makes things clearer.
- Use parentheses (), brackets [], and curly braces {} to make your meaning clear.
- Do not enter 2/4+5 (which is 5 ½) when you really want 2/(4+5) (which is 2/9).
- Do not 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 is always good practice to use parentheses when entering functions. Write sin(t) instead of sint or sin t. WeBWorK has been programmed to accept sin t or even sint to mean sin(t). But sin 2t is really sin(2)t, i.e. (sin(2))*t. Be careful.
- Be careful entering powers of trigonometric, and other, functions. You write (sin(t))^2 for the square of sin(t), and *never* sin^2t.
- For example for the expression $2+3\sin^2(4x)$, 2+3sin^2(4x) is wrong. You should enter: 2+3*(sin(4*x))^2. Why does the last expression work?

  Please Excuse My Dear Aunt Sally

  Operations in parentheses are always done first (4*x) and then (sin(4*x))], next all exponents are taken, giving (sin(4*x))^2, next all multiplications and divisions are performed, giving 3*(sin(4*x))^2. Finally, all additions and subtractions are performed, giving 2+3*(sin(4*x))^2.

- Remember that multiplication and division have the same precedence and there are no universal rules as to which should be done first in the **absence** of parentheses. WeBWorK and many computers read things from left to right, so 2/3*4 means (2/3)*4=8/3. But some other computers will read 2/3*4 as 2/(3*4)=1/6. The same lack of consistent rules concerns powers, expressions like 2^3^4.

  The only way to insure that you are entering what you want to enter is the use of parentheses!!!

- Use the Preview Button to see exactly how your entry appears to the system. For example, to tell the difference between 1+2/3+4 and [1+2]/[3+4] click the Preview Button.
- If a problem calls for a decimal answer, give at least four decimal digits, or as many as the problem specifies. For example, write 2.3453 instead of 2.34.

Intervals in WeBWorK

What is the domain of $f(x)=\sqrt{x}$? One answer is x>=0 (x is greater than or equal to 0). The best way to enter this in WeBWorK is by using interval notation: [0,infinity).

Other intervals:

(2,3] is the set $2 < x \le 3$.

(-infinity,5) is the set $x < 5$.

(-infinity, infinity) is the set of all real numbers.

(2,3]U[4,5) is the set $\{2 < x \le 3 \text{ or } 4 \le x < 5\}$. (This is a union of two intervals and can be very important.)

Mathematical Constants Available In WeBWorK

pi This gives $\pi \approx 3.14159265358979$. So cos(pi) is –1.

e This gives $e \approx 2.718281828459045$. So, ln(e*2) is 1 + ln(2)

Scientific Notation Available In WeBWorK

2.1E2 gives 210

2.1E-2 gives 0.021

aEb gives $a \times 10^b$

Cube roots and *n*th Roots

x^(1/3) gives $\sqrt[3]{x}$, the cube root of x

x^(1/n) gives $\sqrt[n]{x}$, the nth root of x

x^(p/q) gives $\left(\sqrt[q]{x}\right)^p$

Mathematical Functions Available In WeBWorK

abs( ) $|x|$, the absolute value

cos( ) the cosine function. Note: the cosine function uses radian measure

sin( ) the sine function. Note: the sine function uses radian measure

tan( ) the tangent function. Note: the tangent function uses radian measure

sec( ) the secant function. Note: the secant function uses radian measure and $\sec(x) = \frac{1}{\cos(x)}$

exp( ) the exponential function, e^x

log( ) The natural logarithm function. Note that this is NOT the common log function from pre-calculus. $\text{fact}(n) = n(n-1)(n-2)\cdots(3)(2)(1)$

ln( ) Another, more common name for the natural logarithm, $\ln(x)$

logten( ) The common logarithm or log base 10, $\log_{10}(x)$

arcsin( ) The inverse sine function. asin( ) is another name for arcsine.

arccos( ) The inverse cosine function. acos( ) is another name for arccosine.

arctan( ) The inverse tangent function. atan( ) is another name for arctangent.

sqrt( ) The square root function

sgn( ) The sign function — $\text{sgn}(x) = \begin{cases} -1 & \text{if } x < 0 \\ 0 & \text{if } x = 0 \\ 1 & \text{if } x > 0 \end{cases}$

step( ) The step function — $\text{step}(x) = \begin{cases} 0 & x < 0 \\ 1 & x \geq 0 \end{cases}$ (0 if x < 0, 1 if x >= 0)

fact( ) The factorial function (defined only for non-negative integers), $\text{fact}(n) = (n)(n-1)(n-2)\cdots(3)(2)(1)$