Solving for a variable: a minimalized algebra refresher.

By solving for a variable (for example, X), I mean *rearranging the equation to put in a form where the X term is all by itself* as "X," not "−X," or "1/X."

The basic approach is to convert:

1) all additive terms on the same side as the X term to zero by adding the negative value of those terms. The logic here is a) that any variable minus itself equals zero, & b) that any variable plus zero equals that variable. Remember that subtraction is just adding the negative of a value, so the same guideline applies to subtraction.

If you have $W = X + M$, to solve for X, you would subtract M from both sides:

$$-M + W = X + M - M$$
$$-M + W = X + 0$$
$$-M + W = X$$

2) all multiplicative terms to one by multiplying those terms by their inverse. Here the logic is a) that any variable times its inverse equals one, & b) that any variable times one equals that value. Remember that division is just multiplying by the inverse of a value, so the same guideline applies to division.

If you have $Y = X \times N$, to solve for X, you would multiply both sides by $1/N$:

$$1/N \times Y = X \times N \times 1/N$$
$$Y/N = X \times N/N$$
$$Y/N = X \times 1$$
$$Y/N = X$$

When you have multiple operations occurring on the same side as the variable you are solving for, work your way in toward the variable "from the outside." This means work in reverse of the order of operations you would perform to solve for a numerical value for the problem.

Practice problems on the next page.

1) Solve for b: $y = mx + b$

2) Solve for m: $y = mx + b$

3) Solve for M: $D = M/V$

4) Solve for V: $D = M/V$

5) Solve for *n*: $PV = nRT$

6) Solve for $[I^-]$: $K = [Pb^{2+}][I^-]^2$

7) Solve for L: $N - G = U(Z - [1/L])$ (Remember common denominators?)

Later in the semester you will do logs and inverse logs. Many people let their calculators guide them there.