<u>Equations in Quadratic Form</u>

There are many examples of equations that can be rewritten into the form of a quadratic equation. The following are examples of such. A process of substitution will be used to create a quadratic equation.

For example:

$x+6\sqrt{x}+5=0$	***This equation can be written in quadratic form because the problem can be seen as*** $\left(\sqrt{x}\right)^2+6\sqrt{x}+5=0$
$let\quad A=\sqrt{x}$	***The variable*** A ***will be substituted for*** $\sqrt{x}$. ***Bear in mind that you can usually find what you need to substitute for in the middle term of the equation.***
$A^2+6A+5=0$	***This problem is now recognizable in quadratic form. One of the previous methods of solving quadratic equations may now be used to solve the problem.***

It should be understood that this really wasn't necessary. This particular problem could have been solved as a radical equation by isolating $\sqrt{x}$, ***and squaring both sides. However, with different variations of the problem such as*** $\frac{1}{x}+\frac{6}{\sqrt{x}}+5=0$, ***it may not be so obvious what to do. This method makes solving these problems easier. It puts them in a form that is not only immediately recognizable, but will save time. Focus on the middle term to find out what to substitute. <u>Do not forget</u> to check your answers for extraneous roots by substituting into the original problem. All of the skills introduced here will show up at some time in your future coursework. The key is to recognize them when you encounter them. Look beyond the problem, and into the interior of the equation at hand. Look for patterns or something recognizable, much in the same way complex polynomials are factored. This type of problem will show up with trigonometric equations as well; such as the problem*** $16\sin^4 x-16\sin^2 x+3=0$. ***When substituting, do not pick variables that are in the original problem, this could lead to confusion.***