Equations that do *not* appear quadratic at first can be solved using what we just learned.

Intermediate algebra
Class notes
Solving Equations by using Quadratic Methods and Problem Solving (section 18.3)

We have seen some of these equations before. We are essentially talking about equations that, once we manipulate them a bit, become quadratic. We saw this with rational and radical equations. Before we studied the quadratic formula, those equations always would be factorable, since that was the only way we knew how to solve them. Now, some of these equations will require the quadratic formula or other methods like completing the square.

We will also see equations that are "in quadratic form" but they won't be quadratic (meaning the highest exponent on the x's is *not* 2). An example is $x^4 + 2x^2 - 3 = 0$. It may *not* look quadratic but we will see how we can use our quadratic methods (like factoring) to solve it.

expl 1: Solve.

$$x^3 + 9x - x^2 - 9 = 0$$

Is that factorable by grouping?

expl 2: Solve.

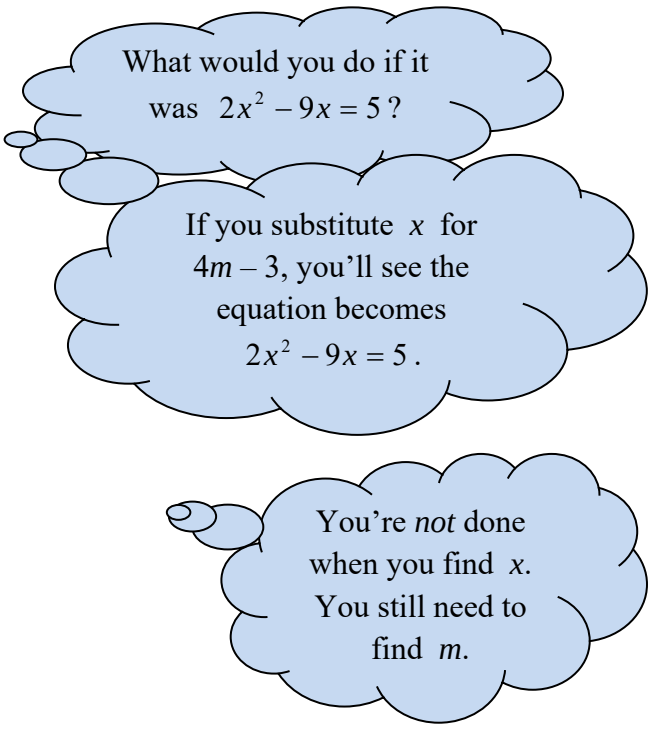
$$x^4 + 2x^2 - 3 = 0$$

What would you do if it was $x^2 + 2x - 3 = 0$?

Try factoring it as $\left(x^2 + ??\right)\left(x^2 - ??\right) = 0$.

expl 3: Solve.

$2(4m-3)^2 - 9(4m-3) = 5$

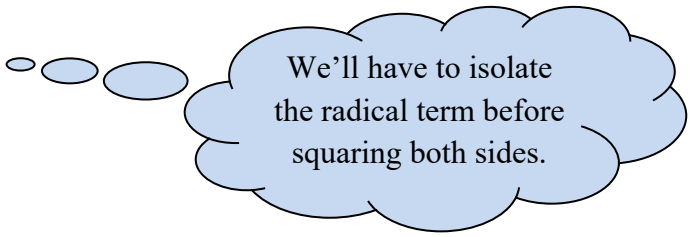


expl 4: Answer the following question.

The product of a number and 8 less than the number is 84. Find the number.

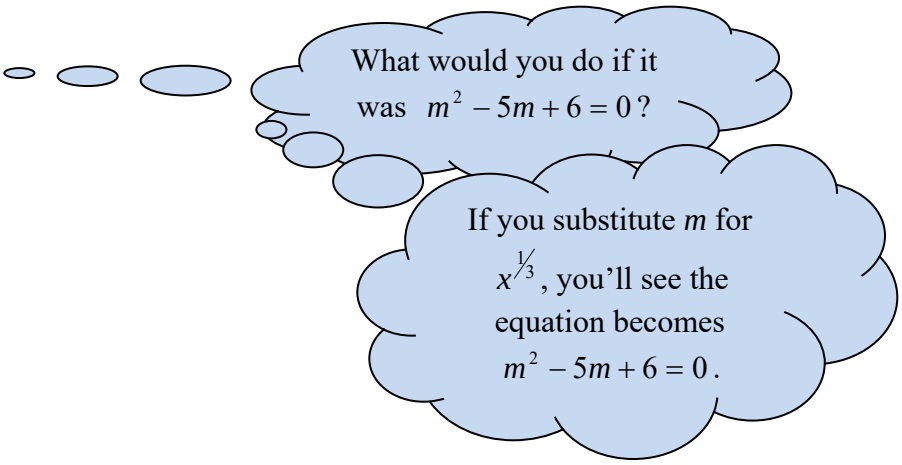
expl 5: Solve.

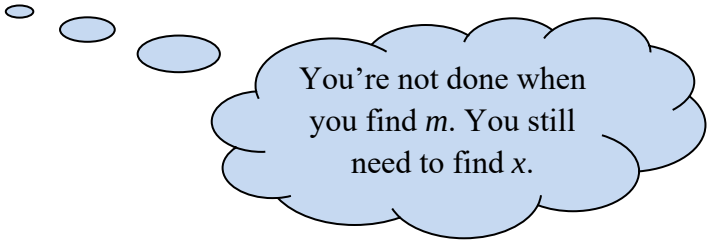
$$x - 3\sqrt{x} = 9$$



expl 6: Solve.

$$x^{2/3} - 5x^{1/3} + 6 = 0$$





expl 7: A landscaper and her apprentice can mow a park in 7 hours if they work together. If the apprentice works alone, he needs two more hours than the landscaper if she had worked alone. Find the time it would take each person to mow the park if they work alone. Round to the nearest tenth of an hour.