## Lesson 13: Completing the Square (Part 2)

* Let’s solve some harder quadratic equations.

### 13.1: Math Talk: Equations with Fractions

Solve each equation mentally.

### 13.2: Solving Some Harder Equations

Solve these equations by completing the square.

#### Are you ready for more?

1. Show that the equation is equivalent to .
2. Write an equation that is equivalent to and that includes .
3. Does this method help you find solutions to the equations? Explain your reasoning.

### 13.3: Spot Those Errors!

Here are four equations, followed by worked solutions of the equations. Each solution has at least one error.

* Solve one or more of these equations by completing the square.
* Then, look at the worked solution of the same equation as the one you solved. Find and describe the error or errors in the worked solution.

Worked solutions (with errors):

1.

2.

3.

4.

### Lesson 13 Summary

Completing the square can be a useful method for solving quadratic equations in cases in which it is not easy to rewrite an expression in factored form. For example, let’s solve this equation:

First, we’ll add  to each side to make things easier on ourselves.

To complete the square, take of the coefficient of the linear term 5, which is , and square it, which is . Add this to each side:

Notice that is equal to 25 and rewrite it:

Since the left side is now a perfect square, let’s rewrite it:

For this equation to be true, one of these equations must true:

To finish up, we can subtract  from each side of the equal sign in each equation.

It takes some practice to become proficient at completing the square, but it makes it possible to solve many more equations than you could by methods you learned previously.



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