Problems leading to quadratic equations
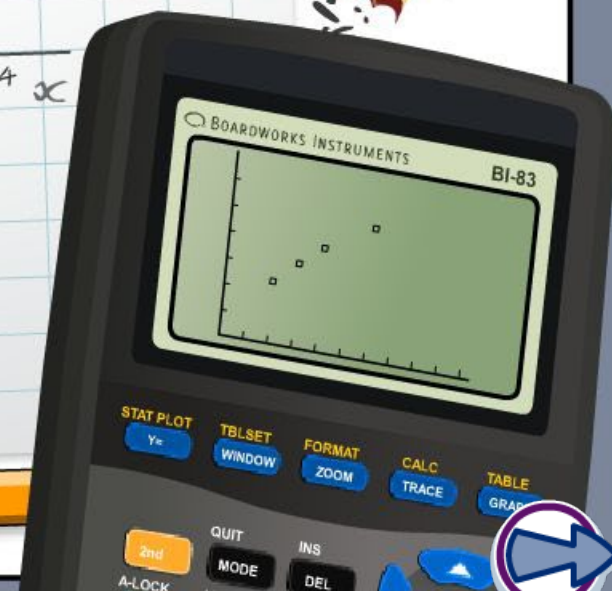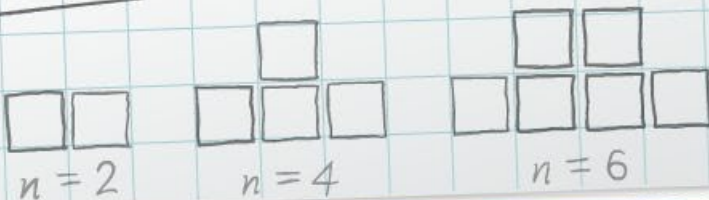
Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

MODELING

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

They are:

1) **Make sense of problems and persevere in solving them.**

2) **Reason abstractly and quantitatively.**

3) **Construct viable arguments and critique the reasoning of others.**

4) **Model with mathematics.**

5) **Use appropriate tools strategically.**

6) **Attend to precision.**

7) **Look for and make use of structure.**

8) **Look for and express regularity in repeated reasoning.**

This icon indicates that the slide contains activities created in Flash. These activities are not editable.

This icon indicates teacher's notes in the Notes field.

Using quadratic equations

Sometimes we are given word problems that we need to solve using quadratic equations. Here is how to approach these problems:

First, think about the question and write out all the information you have been given.

Second, identify what you are trying to find.

Third, use the information you have been given to write a quadratic equation.

Finally, solve the equation and use the solution to answer the original question.

A group of friends found an apartment to rent for the fall semester. The rental fee was $1800 per month, and they planned to share the cost equally.

During the summer, they met two more friends who wished to share the apartment.
The original group was eager to have these extra people because it lowered the per person cost by $150 a month.

How many people were in the original group who found the apartment?

Press "**start**" to begin solving the problem.

start

The lengths of the two legs in a right triangle are x cm and $(x - 7)$ cm. If the length of the hypotenuse is $(x + 1)$ cm, find the value of x and also the lengths of all three sides.
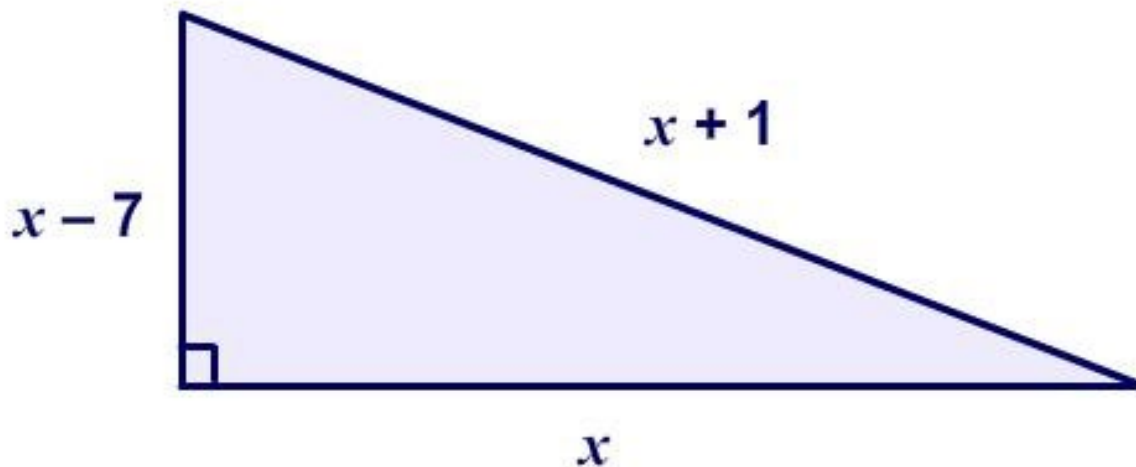
Press the buttons for help:

step 1

step 2

step 3

step 4

$x + 1$

$x - 7$

x

Jenny's commute

Jenny drives 24 miles to get to work. On the way home, she is caught in traffic and drives 20 miles per hour slower than on the way there.

If her total journey time to work and back is 1 hour, what was her average speed on the way to work?

Press the numbers to go through the solution steps:

1 Write the problem as an algebraic equation.

2 Rearrange the equation into quadratic form.

show solution

3 Solve the equation and answer the question.

Mechanics at work

A master mechanic can rebuild an engine in 3 hours less than his apprentice. Working together, it takes them 2 hours.

How long would it take each of them working alone?

Press the numbers to go through the solution steps:

1 Write the problem as an algebraic equation.

2 Rearrange the equation into quadratic form.

3 Solve the equation and answer the question.

show solution