

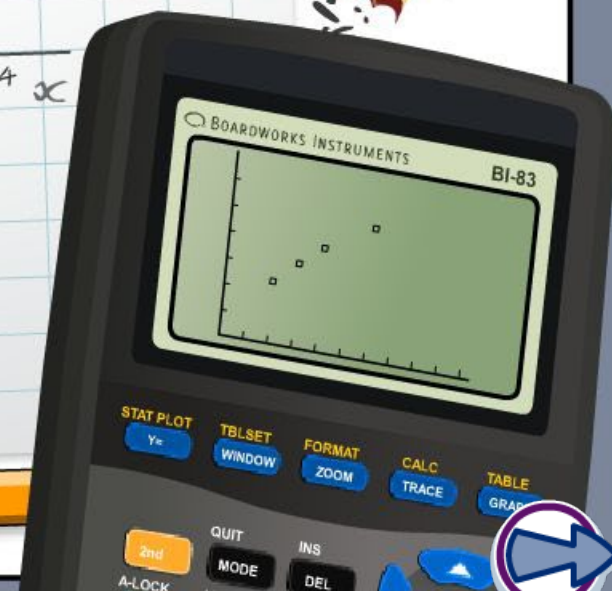
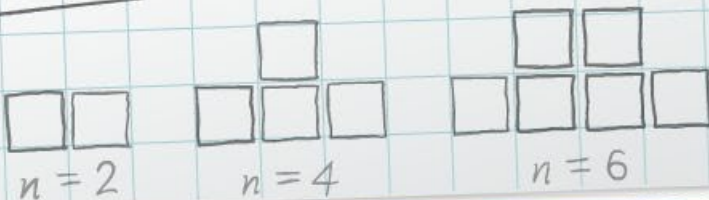
Problems leading to systems of equations

x	-2	-1	0	1	2	3	4
y	5	0	-3	-4	-3	0	5

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

$$(x+1)(x-3) = 0$$

$$x = -1 \text{ or } x = 3$$



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.



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.

Marco thinks that there is only one way to solve the following system of equations:

$$3x - y = 9$$

$$8x + 5y = 1$$

Is Marco correct? Solve the system of equations using substitution.

Now solve the equations using the elimination method instead.

Which method is better / easier?

Systems of equations can be used to solve problems in every day life.



Order the steps for solving systems of equations

first

Decide what letters to use to represent the unknown values

Solve the equations using the most appropriate method

Use the information from the problem to write two equations

C

Press **start** to begin.

problem

last

start

60





Archie is trying to figure out how old his two math teachers are!

Mr. Addison and Miss Peters have given Archie two clues.

- The sum of their ages is 76.
- Mr. Addison is 22 years older than Miss Peters.



How old is each teacher?

Archie thinks the best method of solving the problem is by trial and error. Do you agree? Justify your answer.



Apples and pears

MODELING



board
works

Press the numbered buttons to reveal the method of solving.

Elaine is at the local grocery store. She buys 6 apples and 3 pears for \$3.45. Peter bought 3 apples and 6 pears at the same store and paid \$3.30. How much is an apple? How much is a pear?

Step 1

Step 2

Step 3

Step 4





The Gonzalez family and the Harris family are taking a trip to the circus.

In the Gonzalez family, there are 4 adults and 3 children.

The total cost of their tickets is \$95.

In the Harris family, there are 2 adults and 6 children.

The total cost of their tickets is \$88.

Write a system of equations to describe the costs.

How much does an adult's ticket cost?

How much does a child's ticket cost?





Gonzalez family: 4 adults and 3 children, costing \$95.
Harris family: 2 adults and 6 children, costing \$88.

Let a = adult's ticket cost and c = child's ticket cost.

$$4a + 3c = 95$$

(A)

$$2a + 6c = 88$$

(B)

$$\times 2: 4a + 12c = 176$$

(C)

$$(C) - (A): 9c = 81$$

$$c = \$9$$

Substitute $c = 9$ into equation (B) to find a :

$$2a + 6(9) = 88$$

subtract 54: $2a = 34$

divide by 2: $a = \$17$



Check the prices by substituting back into equation (A).





Use the details below to find out the missing information

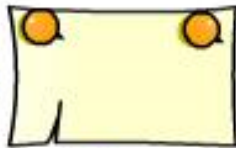
A bus load of 32 people go to the movie theater.

Adults cost \$2.70 and children cost \$1.70.

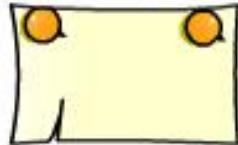
The total bill is \$64.40.

How many adults and children were in the party?

Adults =



Children =



Balancing act



MODELING



board
works

Drag items onto the scale to make it balance. Write and solve a system of equations to find the weight of each money bag.

