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## Systems of Equations – Word Problems

$16c + 24d = 640$   
 $d = 2c$

Substitute  $2c$  for  $d$   
 $c = 10$

Substitute  $10$  for  $c$   
 $d = 20$

- 1 Explain how to solve systems of equations.
  - 2 Determine the costs of supplies for cats as well as dogs.
  - 3 Solve for the number of cats Jessica could buy supplies for.
  - 4 Describe how to solve a system of equations by graphing.
  - 5 Determine the price of dog as well as cat supplies.
  - 6 Decide which graph belongs to the system of equations.
- + with lots of tips, answer keys, and detailed answer explanations for all of the problems.



The complete package, including all problems, hints, answers, and detailed answer explanations is available for all [sofatutor.com](https://www.sofatutor.com) subscribers.



## Explain how to solve systems of equations.

Choose the correct statements.

- An equation like  $3x = 6$  is a system of equations. **A**
- A system of equations has at least two variables. **B**
- A system of equations has at least two equations. **C**
- To solve a system of equations, you can eliminate one variable by substituting in another. **D**
- If you graph the lines corresponding to a system of equations, then the solution is given by the intersection of these lines. **E**



## Hints for solving these problems

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### Explain how to solve systems of equations.

#### Hint #1

Here is an example of a system of equations:

- $2x + 3y = 7$
  - $x = 2y$
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#### Hint #2

In the system of equations given in the first hint,  $x$  equals  $2y$ . So plug in  $2y$  for  $x$  in the first equation to get  $2(2y) + 3y = 7$ .

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#### Hint #3

Keep in mind that you have to find solutions which satisfy all equations.

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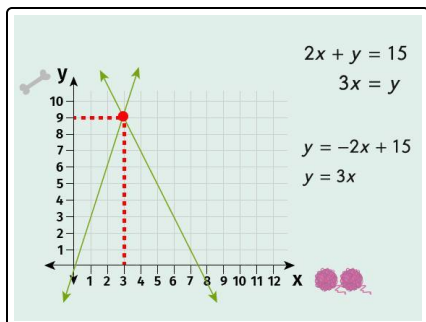


## Answers and detailed answer explanations for these problems

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### Explain how to solve systems of equations.

**Answer key:** B, C, D, E



A system of equations is not only one equation with one variable, but two equations with two variables, or more equations with more variables!

Remember that solutions to a system of equations must satisfy every equation in the system. Not just one equation in the system.

How can we solve a system of equations?

We can eliminate one variable; let's have a look at the following

example:

- $2x + 3y = 7$
- $x = 2y$

Substituting  $2y$  for  $x$  in the first equation gives  $4y + 3y = 7y = 7$ . Dividing by 7 gives us  $y = 1$ , and thus  $x = 2 \times 1 = 2$ .

We can also get the solution by graphing: we draw the lines corresponding to the equations in a coordinate system. The point of intersection gives us the solution, as pictured above!