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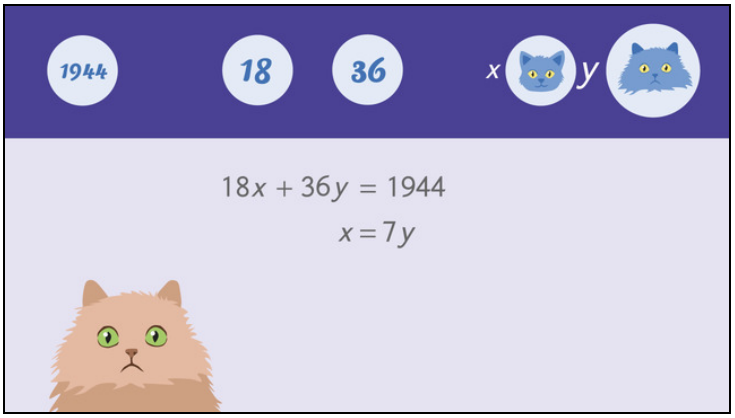
Solving Systems of Equations by Substitution



1 **Determine the two equations that are needed to correctly describe Miss Anderson's problem.**

2 Explain how to solve a system of equations by substitution.

3 Determine the number of long-haired and short-haired cats by substitution.

4 Decide how many dogs Miss Lovingdogs can bring to the dog stylist.

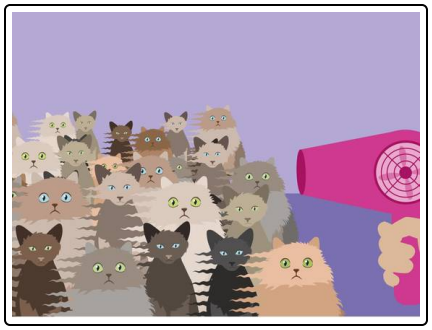
5 Write a system of equations for each situation and solve them.

6 Solve the system of equations.

\+ with lots of tips, answer keys, and detailed answer explanations for all of the problems.

Determine the two equations that are needed to correctly describe Miss Anderson's problem.

Choose the correct equations.



Miss Anderson has a lot of cats, short-haired and long-haired ones. She brings her cats to the cat stylist. The cost is $\$18$ to groom short-haired cats and $\$36$ for long-haired cats.

She has a budget of $\$1944$.

The number of short-haired cats is seven times the number of long-haired cats.

Use x to represent the number of short-haired cats and y for the number of long-haired cats.

- [ ] **A** $18 + x + 36 + y = 1944$
- [ ] **B** $18x + 36y = 1944$
- [ ] **C** $18x \times 36y = 1944$
- [ ] **D** $x = 7y$
- [ ] **E** $x = y + 7$
- [ ] **F** $7x = y$

Hints for solving these problems

1 of 6

Determine the two equations that are needed to correctly describe Miss Anderson's problem.

Hint #1

If the number of long haired cats is 3, the number or short haired cats is $7 \times 3 = 21$. Which equation reflects this information?

Answers and detailed answer explanations for these problems

1 of 6

Determine the two equations that are needed to correctly describe Miss Anderson's problem.

Answer key: B, D

First, we write a system of equations using the given information.

We'll use x for the number of short-haired cats and y for the number of long-haired cats.

Next, we take a look at the costs:

- Miss Anderson has a budget of $\$1944$.
- The styling cost for short-haired cats is $\$18$ and $\$36$ for long-haired cats.
- The equation to describe this situation is $18x + 36y = 1944$.

We also know that Miss Anderson has seven times more short-haired cats than long-haired cats. This information, written mathematically, is $x = 7y$.

So we have the following system of equations:

$$\begin{aligned} 18x + 36y &= 1944 \\ x &= 7y \end{aligned}$$