Unit 2 Lesson 17: Systems of Linear Equations and Their Solutions

1 A Curious System (Warm up)

Student Task Statement

Andre is trying to solve this system of equations: $\begin{cases} x + y = 3 \\ 4x = 12 - 4y \end{cases}$

Looking at the first equation, he thought, "The solution to the system is a pair of numbers that add up to 3. I wonder which two numbers they are."

1. Choose any two numbers that add up to 3. Let the first one be the x-value and the second one be the y-value.

2. The pair of values you chose is a solution to the first equation. Check if it is also a solution to the second equation. Then, pause for a brief discussion with your group.

3. How many solutions does the system have? Use what you know about equations or about solving systems to show that you are right.

2 What's the Deal?

Student Task Statement

A recreation center is offering special prices on its pool passes and gym memberships for the summer. On the first day of the offering, a family paid $96 for 4 pool passes and 2 gym memberships. Later that day, an individual bought a pool pass for herself, a pool pass for a friend, and 1 gym membership. She paid $72.

1. Write a system of equations that represents the relationships between pool passes, gym memberships, and the costs. Be sure to state what each variable represents.

2. Find the price of a pool pass and the price of a gym membership by solving the system algebraically. Explain or show your reasoning.

3. Use graphing technology to graph the equations in the system. Make 1-2 observations about your graphs.

3 Card Sort: Sorting Systems

Student Task Statement

Your teacher will give you a set of cards. Each card contains a system of equations.

Sort the systems into three groups based on the number of solutions each system has. Be prepared to explain how you know where each system belongs.

4 One, Zero, Infinitely Many (Optional)

Student Task Statement

Here is an equation: $5x - 2y = 10$.

Create a second equation that would make a system of equations with:

1. One solution

2. No solutions

3. Infinitely many solutions

Images for Activity Synthesis

A System with _____ (One, No, Many) Solution(s)

Meaning: What does it mean for a system to have (one, no, many) solution(s)?	**Equations**: What are some characteristics of the equations in such system? (Give an example, if possible.)
Graphs: What are some characteristics of the graphs of the equations in the system? (Sketch an example, if possible.)	**Solutions**: What would we get when solving the system of equations algebraically? (Give an example, if possible.)

	Graphs: What are some characteristics of the graphs of the equations in the system? (Sketch an example, if possible.)	**Solutions**: What do we get when solving the system of equations algebraically? (Give an example, if possible.)
One Solution		
Many Solutions		
No Solutions		