## 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: $\left\{\begin{matrix}x+y=3\\4x=12−4y\end{matrix}\right.$

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







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