Algebra 2

1-03 Solve Linear Systems in Three Variables

- Linear equation in 3 variables graphs a _______________

Solution to system in 3 variables

- Ordered _____________ (_____________)

Is $(2, -4, 1)$ a solution of $\begin{cases} x + 3y - z = -11 \\ 2x + y + z = 1 \\ 5x - 2y + 3z = 21 \end{cases}$

Elimination Method

Like two variables, you just do it _________________ once.

1. Combine _____________ and _____________ to eliminate a variable
2. Combine _____________ and _____________ to eliminate the _____________ variable as before
3. Combine these ____________ equations to find the ________ variables
4. Substitute those _________ variables into one of the _________________ equations to get the _________ variable

- If you get a _____________ statement like 8 = 0 → _________ solution
- If you get an _____________ like 0 = 0 → ______________________ solutions

Solve $\begin{cases} 2x + 3y + 7z = -3 \\ x - 6y + z = -4 \\ -x - 3y + 8z = 1 \end{cases}$

Solve $\begin{cases} -x + 2y + z = 3 \\ 2x + 2y + z = 5 \\ 4x + 4y + 2z = 6 \end{cases}$

Solve $\begin{cases} x + y + z = 6 \\ x - y + z = 6 \\ 4x + y + 4z = 24 \end{cases}$

If there are infinitely many solutions

- Let ______________ (Use x, y, or z based on what is convenient)
- Solve for ______ in terms of _________
- Substitute those to find _______ in terms of ________
- Sample answer ________________________

You have $1.42 in quarters, nickels, and pennies. You have twice as many nickels as quarters. You have 14 coins total. How many of each coin do you have?

32 #1, 5, 9, 15, 17, 19, 23, 43, 47, 51, 53, 55 = 12 (You can solve them all by elimination if you want.)