<u>Solving Three-Variable Systems Class Work</u>
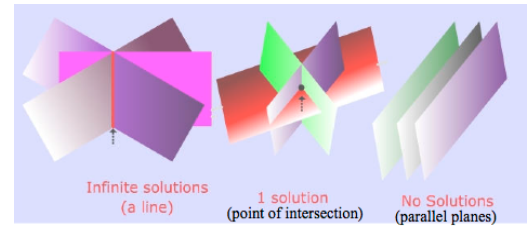
✞ **Objective:** *You will be able to solve systems of equations in which three variables are involved.*

✱ *The solution to a system of three equations with three variables exists at the point where all three of the planes intersect.*

If the planes intersect in a line, there are infinite solutions, and

If the planes are all parallel, then there are no solutions.

✱ *Guided Example:* Solve the system of equations:

$$12x - 2y + 8z = 43.6$$
$$-3x + 6y + 2z = 63.6$$
$$8x - 9y - 4z = -108.6$$

➔ *Label each equation.*

➔ *Create two pairs of equations and eliminate the same variable in each pair.*

➔ *You should have two resulting equations! Create and solve a system from these equations.*

➔ *Apply substitution to determine the third variable.*

➔ *Check that your three variables hold for all three equations!* ☺

✎ **Now You Try Some!** *(You may work on scrap paper as necessary.)* **Solve (and check) each system.**

1.

$$3x - 2y + 8z = -71$$
$$-2x + 4y - 2z = 42$$
$$10x + 8y - 3z = 22$$

2.

$$2x - 3y + z = -21$$
$$-x + 5y - 3z = 41$$
$$3x - 4y + 5z = -58$$

Homework: p. 154#25, 27, 29, 31, 47, and 49 (check solutions with back of the book!)

Extra Practice:

Solve the system:

$$4b - 2w + 3h = 80$$
$$-5b + 3w - 2h = -92$$
$$-2b - 8w - 4h = 48$$

p. 154 # 26-38 evens, 46, and **48**

Option A: *In your own words, describe the process of solving a system in three variables.*

Option B: *Create a system of three equations in which the solution is (-1,2,-3).*

Option C: Write down any questions you still have regarding solving systems in three variables.