

Skill/Objective: I can solve systems of equations with 3 variables by using elimination.

Variable z

Example 1:

$$x + 2y + z = 10 \quad (1)$$

$$2x - y + 3z = -5 \quad (2)$$

$$\cancel{2x - 3y - 5z = 27} \quad (3)$$

Steps to solve:

Observations:

- 3 variables (x, y, z)
- 2 have coefficient of 1
- 3 equations
- no zero pairs → nothing cancels
- equations 2 & 3 have "2x"

$$\begin{array}{rcl} -1(2x - y + 3z = -5) & \rightarrow & (x + 2y + z = 10) \\ -2x + y - 3z = 5 & & 2x - y + 3z = -5 \\ 2x - 3y - 5z = 27 & & -2x - 4y - 2z = 27 \end{array}$$

$$\begin{array}{rcl} -2y - 8z & = & 32 \\ -40y + 8z & = & -200 \\ \hline -42y & = & -168 \\ \hline y & = & 4 \end{array}$$

How does your prior knowledge of solving systems of equations with two variables help you to solve these problems? Be specific.

We do

Example 2:

$$2x - y + 3z = -2$$

$$x + 4y - 2z = 16$$

$$5x + y - z = 14$$

Observations: