

CLO: Students will use what they know about solving systems of equations to help them discover methods for solving systems of equations in three variables in order to build their algebraic solving skills.

Warm - Up

Solve the system of equation in two variables

$$3x + 2y = 12$$

$$5x - 2y = 20$$

$$\begin{array}{r} x=4 \\ y=0 \\ \hline 8x=32 \\ \hline 8 \quad 8 \end{array} \quad \begin{array}{r} 3x+2y=12 \\ 12+2y=12 \\ -12 \quad -12 \\ \hline 2y=0 \\ \hline \frac{2y}{2}=\frac{0}{2} \end{array}$$

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Stand up. Find a partner who is not at your table.

Compare and contrast the system below with the systems we did in our do now. Make **at least** 10 observations.

$$\begin{array}{l} 4) \quad -4x + 5y - 2z = -22 \\ \quad -3x - 3y + 2z = 28 \\ \quad 5x + 2y + 2z = -8 \end{array}$$

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Share out of noticings.

Standard form

Whole number in each equation,  $x, y, z$

3 variable vs 2 variable

3 equations vs 2 equations

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Ideas on how to solve systems of equations in three variables.

Possibly use substitution twice

Group equations 1,2,3 1,3 & 1,2 depending on situation

Eliminate one variable solve for the other 2.

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We will now go through guided notes to develop our understanding of the process for solving systems of equations in three variables.

CLO: Students will practice solving systems of equations in three variables in order to build their algebraic solving skills and strengthen their understanding of algebraic manipulation.

### Warm - Up

$$\begin{aligned}x + y - z &= -1 \\x + 3y + z &= -3 \\2x + 2y - z &= 0\end{aligned}$$

$$\begin{cases} 5r - s - 5t = -6 \\ -5r - s + 5t = 4 \\ r + s + 5t = -18 \end{cases} \quad (-4, 1, -2)$$

$$\begin{array}{r} \cancel{5r} - s - 5t = -6 \\ -\cancel{5r} - s + 5t = 4 \\ \hline -2s + 0t = -2 \end{array}$$

$$\begin{array}{r} -2s + 0(-3) = -2 \\ -2s = -2 \end{array}$$

$$\boxed{s = 1}$$

$$r + 1 + 5(-3) = -18$$

$$r + 1 - 15 = -18$$

$$\begin{array}{r} r - 14 = -18 \\ +14 \quad +14 \\ \hline r = -4 \end{array} \quad \boxed{r = -4}$$

$$2(-2s + 0t = -2)$$

$$\begin{array}{r} \cancel{4s} + 30t = -86 \\ -\cancel{4s} + 0t = -4 \\ \hline 30t = -90 \\ \frac{30}{30} \quad \frac{30}{30} \\ \hline \boxed{t = -3} \end{array}$$

$$\begin{array}{r} \cancel{-5r} - s + 5t = 4 \\ 5(\cancel{r} + s + 5t = -18) \\ \hline 5r + 5s + 25t = -90 \end{array}$$

$$4s + 30t = -86$$

$$4s + 30(-3) = -86$$

$$4s - 90 = -86$$

$$+90 \quad +90$$

$$\begin{array}{r} 4s = 4 \\ \boxed{s = 1} \end{array}$$