Warmup

Solve the following system of equations using algebra and tell what type of system it is. → Consistent (Dependent Solution)

① $6x + 6y - 12z = 12$
② $3x - y + z = 1$
③ $2x + 2y - 4z = 4$

$6x + 6y - 12z = 12$
←) $6x - 2y + 2z = 2$
④ $8y - 14z = 10$

$6x - 2y + 2z = 2$
←)$6x + 6y - 12z = 12$
⑤ $-8y + 14z = -10$

$\boxed{\text{let } z = t}$

$8y - 14t = 10$

$8y = 14t + 10$

$y = \dfrac{14t + 10}{8}$

$\boxed{y = \dfrac{7t + 5}{4}}$

$2x + 2\left(\dfrac{7t+5}{4}\right) - 4t = 4$

$2x + \left(\dfrac{7t+5}{2}\right) - 4t = 4$

$4x + 7t + 5 - 8t = 8$

$4x = t + 3$

$\boxed{x = \dfrac{t + 3}{4}}$

Questions from Homework

② c) $4x + 3y - z = -7$

$3x - 2y + 3z = -10$

$x + y - z = -2$

$$\left(\begin{array}{ccc|c} 4 & 3 & -1 & -7 \\ 3 & -2 & 3 & -10 \\ 1 & 1 & -1 & -2 \end{array}\right) \begin{array}{l} 3① - 4② \\ 3③ - ② \end{array} \left(\begin{array}{ccc|c} 4 & 3 & -1 & -7 \\ 0 & 17 & -15 & 19 \\ 0 & 5 & -6 & 4 \end{array}\right) \xrightarrow{} 5② - 17③ \left(\begin{array}{ccc|c} 4 & 3 & -1 & -7 \\ 0 & 17 & -15 & 19 \\ 0 & 0 & 27 & 27 \end{array}\right)$$

$27z = 27$

$\boxed{z = 1}$

$17y - 15z = 19$

$17y - 15(1) = 19$

$17y = 34$

$\boxed{y = 2}$

$4x + 3y - z = -7$

$4x + 3(2) - 1 = -7$

$4x = -12$

$\boxed{x = -3}$

$(-3, 2, 1)$

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Solve the following system of equations using an augmented matrix reduced to its row echelon form...

$$2x + 2y + 4z = 0$$
$$x - 2y + z = 3$$
$$2x + 5y + 8z = 6$$

1. **Express system in the form of an augmented matrix**
2. **Eliminate *"x"* in equation 2 and 3.**
3. **Eliminate *"y"* in equation 3 (must add/subtract 2 and 3)**
4. **Create triangle of zeroes and solve.**

Check with TI-83

Homework

Worksheet #

Solve the system of equations using matrix elimination!