



7-3 Solving Multivariable Systems of Equations

- Rules:
1. We may interchange two rows
 2. We may multiply a row by a non-zero number
 3. We may add a multiple of one equation to another

Ex 1 Solve:

$$\begin{array}{r}
 6 + 1 + 3z = -8 \\
 2x + y + 3z = -8 \\
 x - 2y + z = -4 \\
 3x + 4y + 2z = 3
 \end{array}$$

$$3z = -15$$

$$z = -5$$

$$x + 8 = 11$$

$$x = 3$$

$$15y = 15$$

$$y = 1$$

$$(3, 1, -5)$$

$$\begin{array}{r}
 -2x + 4y - 2z = 8 \\
 3x + 4y + 2z = 3
 \end{array}$$

$$x + 8y = 11$$

$$2x + y + 3z = -8$$

$$-3x + 6y - 3z = 12$$

$$-x + 7y = 4$$

Ex 2 Solve:

$$\begin{array}{r}
 x + y + z = 6 \\
 2(3x - y + 5z = -8) \\
 2x + 2y - 3z = 7 \\
 6x - 2y + 10z = -16
 \end{array}$$

$$-2(4x + 6z = -2)$$

$$4x + 6 = -2 \quad 4x = -8$$

$$8x + 7z = -9$$

$$-8x + 12z = +4$$

$$-2 + y + 1 = 6$$

$$y = 7$$

$$(-2, 7, 1)$$

$$-5z = -5$$

$$z = 1$$

$$x = -2$$

No solution - inconsistent

Infinite solutions - dependent

Ex 3. Solve

$$\begin{array}{l} x + y - 3z = -1 \\ y - z = 0 \\ -x + 2y = 1 \end{array} \begin{array}{l} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \begin{array}{l} 3y - 3z = 0 \\ y - z = 0 \\ 0 = 0 \end{array}$$

Homework
p.506
#15-25 odds