

1.1 - Systems of Linear Equations

$$a_{11}x_1 + a_{12}x_2 + a_{13}x_3 = b_1$$

a_{ij}

$$a_{21}x_1 + a_{22}x_2 + a_{23}x_3 = b_2$$

i - row

j - column

$$a_{31}x_1 + a_{32}x_2 + a_{33}x_3 = b_3$$

Example

$$\begin{cases} x_1 - 3x_2 + x_3 = 8 \\ x_2 + 3x_3 = 5 \\ x_3 = 2 \end{cases}$$

Row-Echelon
form,

solved by

back-substitution

Equivalent Systems

- interchange rows
- multiply row by non-zero constant
- add multiple of one row to another

Example

$$2x_1 + x_2 + 4x_3 = -3$$

$$3x_1 - 2x_2 - 3x_3 = 5$$

$$x_1 + 2x_2 + 2x_3 = 6$$

- Rewrite in
Row-Echelon form
by manipulating
equations towards
stair-structure.

(Remember to make
leading coefficients = 1)