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MA1101R

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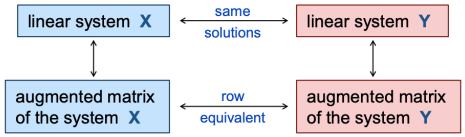
01. LINEAR SYSTEMS

- **zero equation** $\rightarrow$ coefficients are all zero
  - either 0 or infinitely many solutions
- **inconsistent** $\rightarrow$ has no solutions
- **solution set** $\rightarrow$ *set* of all solutions to the equation
  - $\{(1_s, 2s, s) \mid s \in \mathbb{R}\}$
- **general solution** $\rightarrow$ *expression* that gives us all solutions to the equation
  - $\begin{cases} x = t \\ y = 2t + 1 \end{cases}$



elementary row operations

1. $cR_i, c \neq 0$ - multiply by a non-zero constant
2. $R_i \leftrightarrow R_j$ - interchange 2 equations
3. $R_i + cR_j, c \in \mathbb{R}$ - add a multiple of one equation to another equation

(reduced) row echelon forms

- # of pivot columns = # of leading entries = # of nonzero rows
- every matrix has a **unique** RREF but can have multiple REF.

homogenous linear systems

- **homogenous** $\rightarrow$ rightmost column is all zeros
- either:
  - one solution - **trivial solution**
  - infinitely many solutions AND the trivial solution