Linear System = System of Linear Equations

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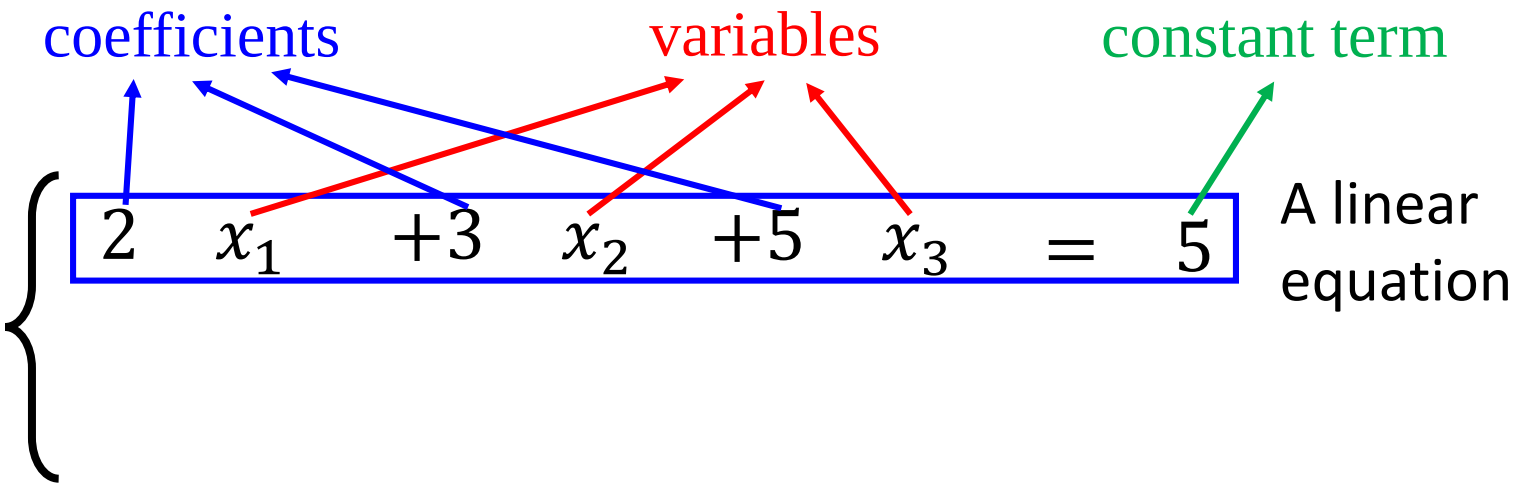
Review

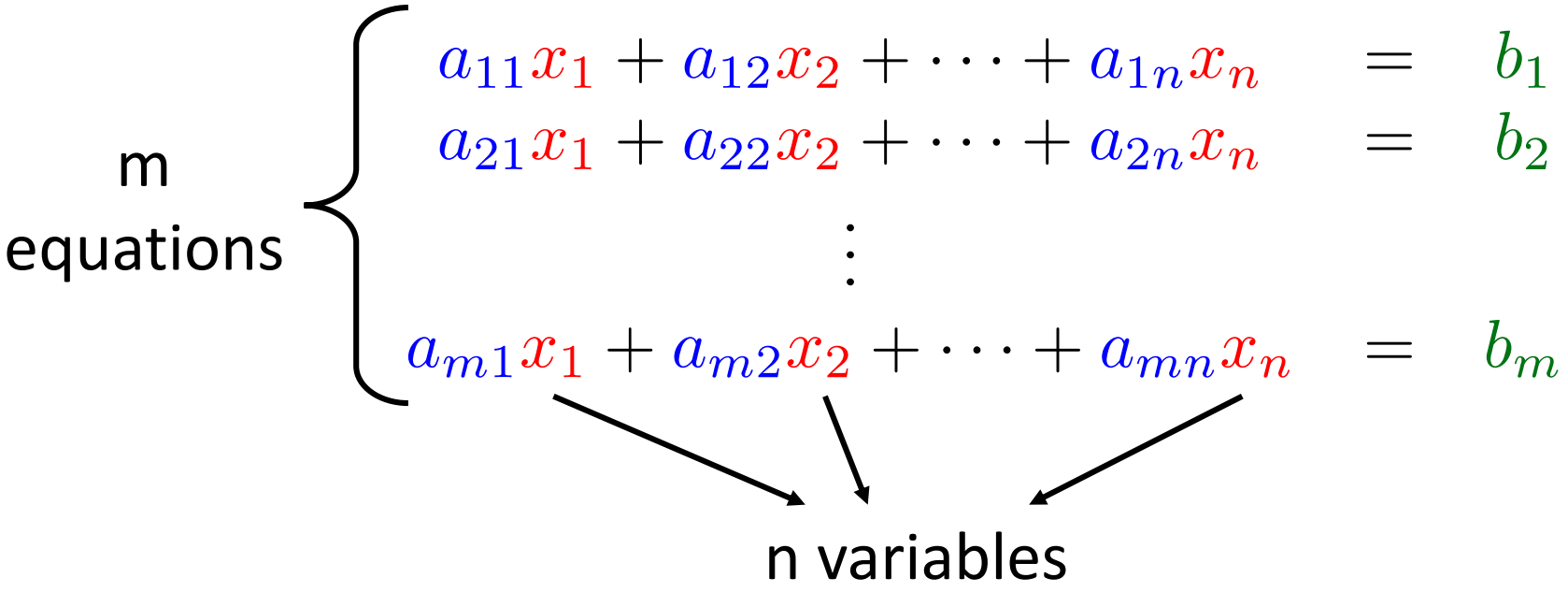
- A system of linear equations



I believe you know how to solve it.

Review

- A system of linear equations (多元一次聯立方程式)

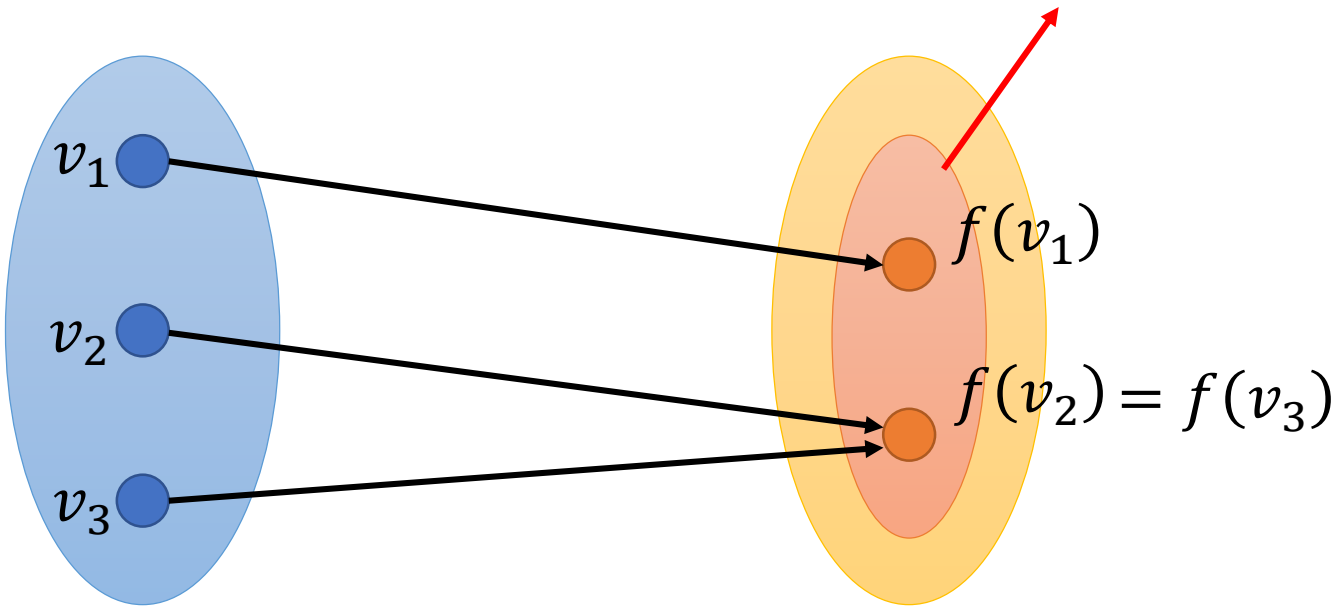


In this course, m and n can be large

Review - Terminology

What ***actually*** come out of function f

- Given a function f

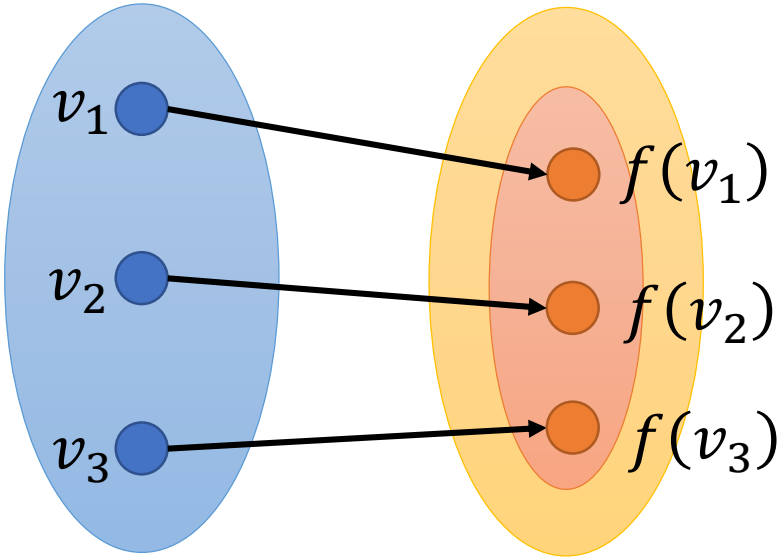


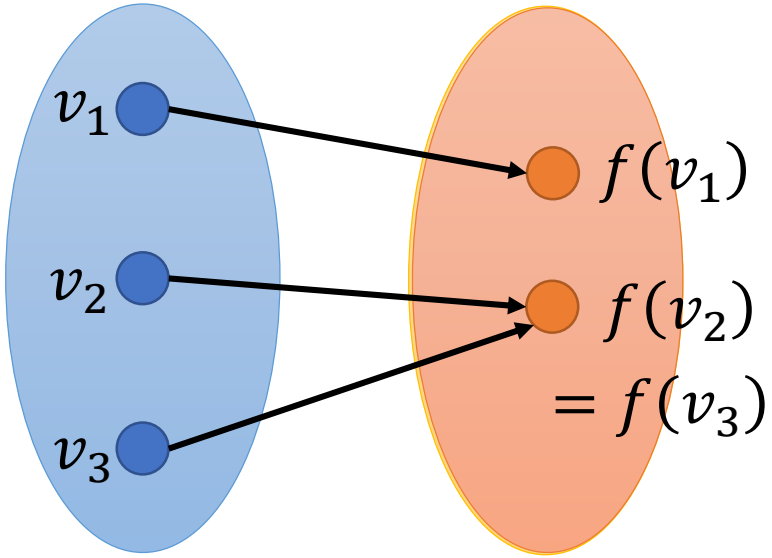
What can go into function f

What ***may possible*** come out of function f

Review - Terminology

- one-to-one (一對一)
- Onto (映成)

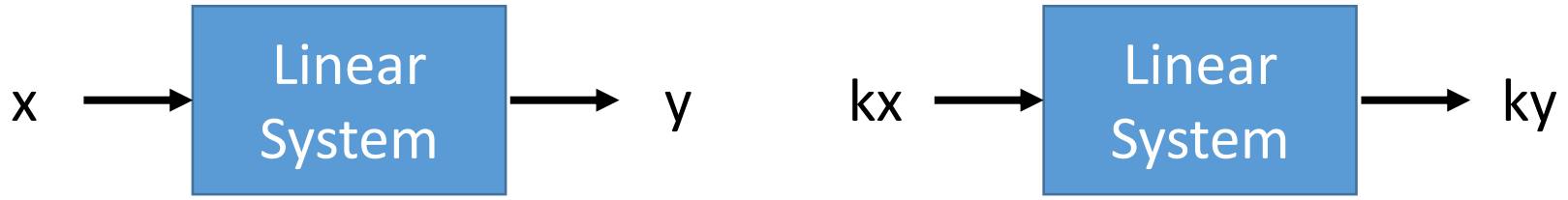




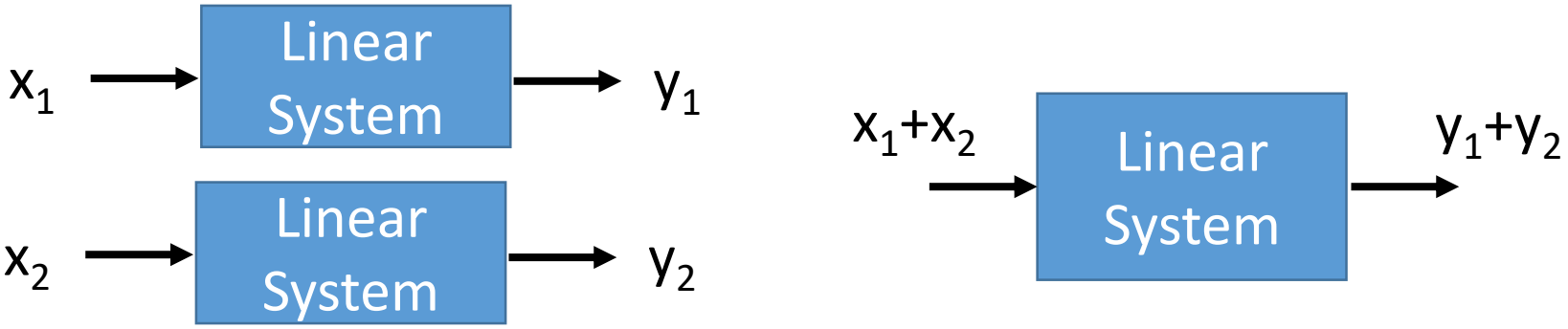
Co-domain = range

Review - Linear System

- Linear system have two properties
  - 1. Persevering Multiplication



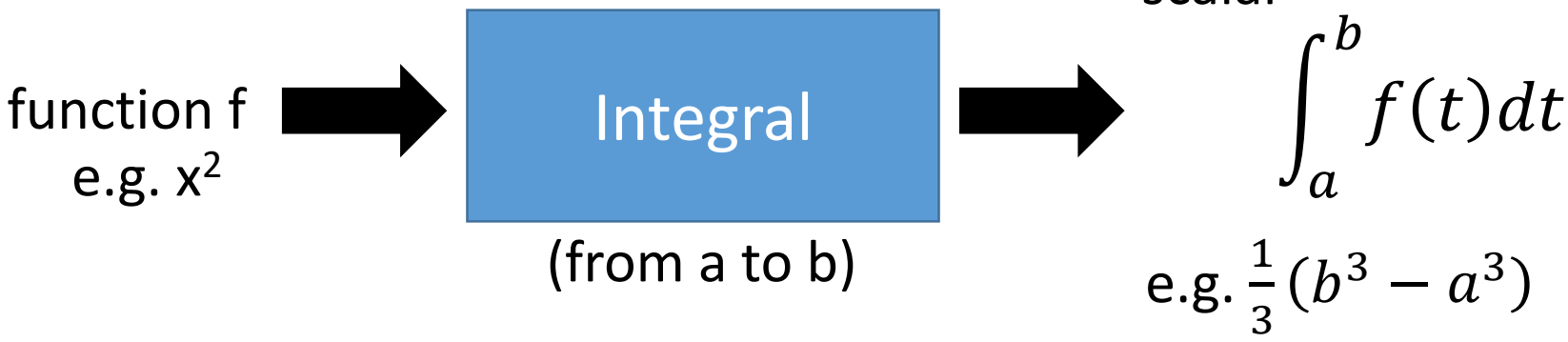
  - 2. Persevering Addition



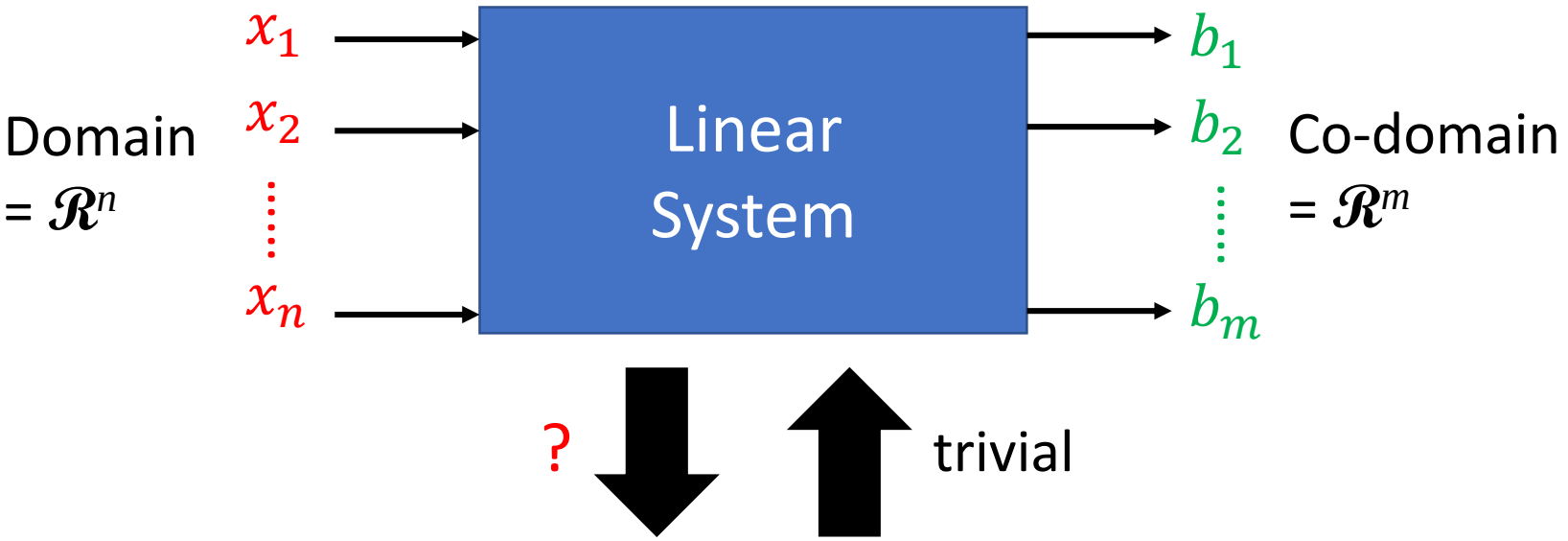
Question

- Derivative: linear?

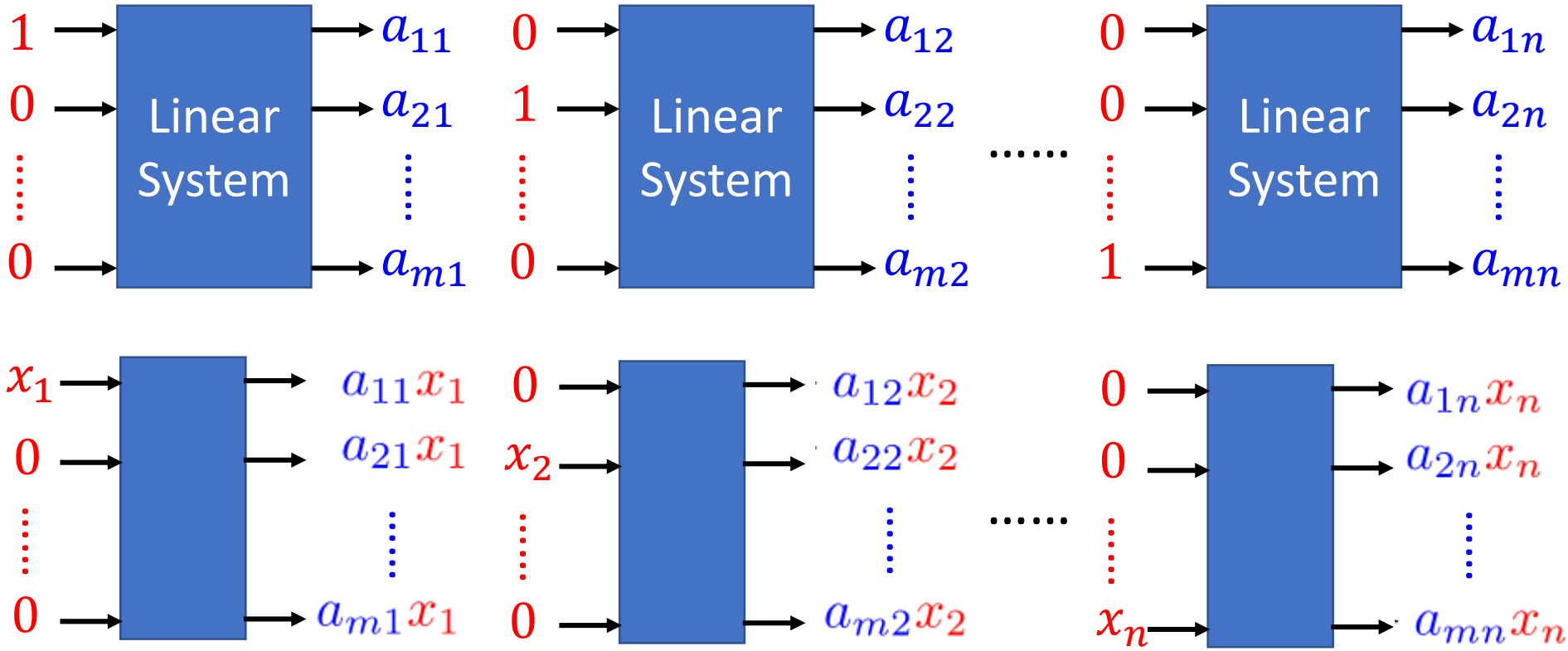
- Integral from a to b linear?

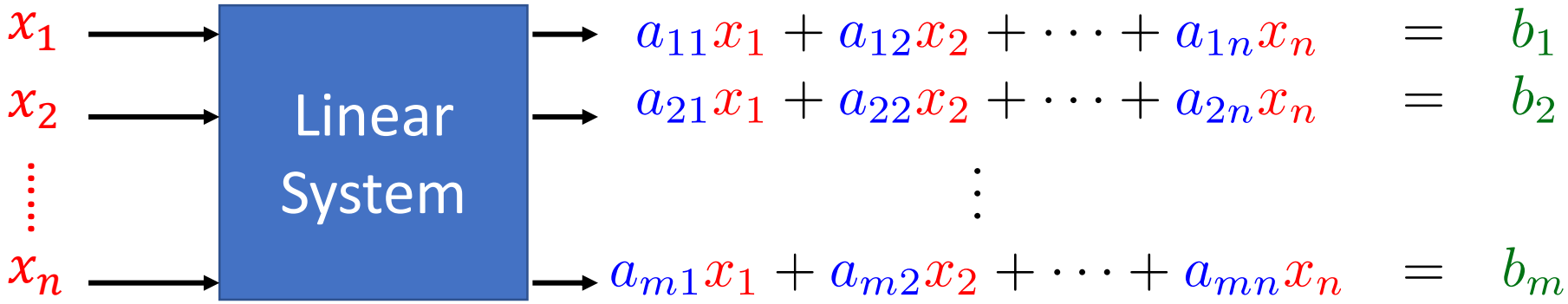


Linear System v.s. System of Linear Equations



$$
\begin{aligned}
a_{11}x_1 + a_{12}x_2 + \cdots + a_{1n}x_n &= b_1 \\
a_{21}x_1 + a_{22}x_2 + \cdots + a_{2n}x_n &= b_2 \\
&\vdots \\
a_{m1}x_1 + a_{m2}x_2 + \cdots + a_{mn}x_n &= b_m
\end{aligned}
$$





A linear system is described by a system of linear equations