§ 1.3 Matrices & Elementary Row Operations.

Not^n: Abbreviate system (1-1) as

$AX = Y$

where $A = \begin{pmatrix} A_{11} & \cdots & A_{1n} \\ & & \\ A_{m1} & \cdots & A_{mn} \end{pmatrix}$ $X = \begin{pmatrix} x_1 \\ \vdots \\ x_n \end{pmatrix}$ $Y = \begin{pmatrix} y_1 \\ \vdots \\ y_m \end{pmatrix}$

A is called the matrix of cofficients of the sys.

Remarks:

(1) For now, it is just a shorthand
(Mat mult will appear later)

(2) A is strictly, is not a matrix

it is a represent^n

An $m \times n$ matrix over the field F
is a function (A)
from (i, j) $1 \le i \le m$, $1 \le j \le n$

\# rows

\# qs

into the field.

$A(i,j)$ = "matrix entry at row i col j"

Story: We consider elementary op^{n}s.

"linear combination"

Inf Defn. Elementary row operations on an $m \times n$ matrix A over F are defined as follows:

1. Multipl^n of one row of A by a non-zero scalar c.

$A = $, $c \times$

2. Replacement of the r^{th} row of A by row r plus c times rows.

3. Interchange of two rows of A.

$A =$ $s^{th} \rightarrow$, $r^{th} \rightarrow$

$r(A) + c\,r(s)$