

# Financial Mathematics

Introduction to  
row and column operations

0025-1. Let  $M := \begin{bmatrix} 1 & 1 & 4 & 11 & 6 \\ 2 & 1 & 7 & 16 & 8 \\ 5 & 4 & 19 & 49 & 26 \\ 7 & 1 & 22 & 41 & 18 \end{bmatrix}$ .

- Do “row magic” to  $M$ , indicating clearly all the row operations used.
- Put  $M$  in row canonical form, indicating clearly all the row operations used.
- Put  $M$  in fully canonical form, indicating clearly all the row & col ops used.
- Write  $M = E_1 \cdots E_k C E'_1 \cdots E'_l$  where  $E_1, \dots, E_k, E'_1, \dots, E'_l$  are elementary and  $C$  is fully canonical.

0025-2. Solve

$$\begin{aligned}5w + 3x - 2y - 3z &= 3 \\-3w + x - 3y - 4z &= -18 \\4w + x + 3y + 4z &= 22 \\-3w + 2x + 2y + 3z &= 6.\end{aligned}$$