

① We use a vertical line to separate the coefficient entries from the constants, essentially replacing the equal signs, when a system is written in this form, we call it an augmented matrix.

$$\left[\begin{array}{cccc|c} 1 & 2 & -3 & 4 & 2 \\ 2 & 5 & -2 & 1 & 1 \\ 5 & 12 & -7 & 6 & 3 \end{array} \right]$$

② $A = \begin{bmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & -4 \end{bmatrix}$

$$A^2 = \begin{bmatrix} 25 & 49 & 1 \\ 49 & 64 & 4 \\ 1 & 4 & 16 \end{bmatrix}$$

$$2A = 2 \begin{bmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & -4 \end{bmatrix} = \begin{bmatrix} 10 & -14 & 2 \\ -14 & 16 & 4 \\ 2 & 4 & -8 \end{bmatrix}$$

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