

Gauss - Jordan Elimination

استبعاد جاورس - جوردن من أجل أنظمة المعادلات الخطية

عد نظام المعادلات الخطية التالي باستخدام طريقة

استبعاد جاورس جوردن

$$x + 3y + 2z = 2$$

①

$$2x + 7y + 7z = -1$$

②

$$2x + 5y + 2z = 7$$

③



$$\rightarrow \left[\begin{array}{ccc|c} 1 & 3 & 2 & 2 \\ 2 & 7 & 7 & -1 \\ 2 & 5 & 2 & 7 \end{array} \right]$$

المصفوفة الممتدة

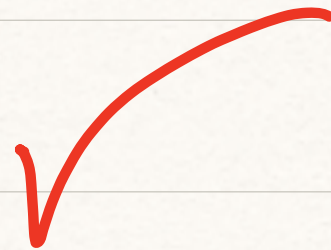
Augmented Matrix

$$\downarrow \left[\begin{array}{ccc|c} 1 & 0 & 0 & \\ 0 & 1 & 0 & \\ 0 & 0 & 1 & \end{array} \right] = I$$

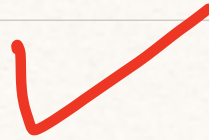
$$R_2(-1) \rightarrow R_2$$

$$\left[\begin{array}{ccc|c} 1 & 3 & 2 & 2 \\ -2 & -7 & -7 & +1 \\ 2 & 5 & 2 & 7 \end{array} \right]$$

$$R_3 + R_1 \rightarrow R_3$$

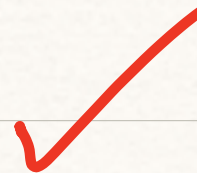


$$\begin{bmatrix} 1 & 3 & 2 & | & 2 \\ 0 & -2 & -5 & | & 8 \\ 2 & 5 & 2 & | & 7 \end{bmatrix}$$



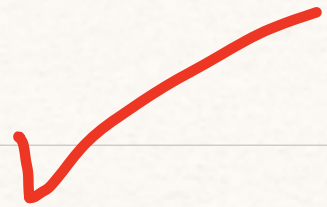
$$R_1(-2) + R_3 \rightarrow R_3$$

$$\begin{bmatrix} 1 & 3 & 2 & | & 2 \\ 0 & -2 & -5 & | & 8 \\ 0 & -1 & -2 & | & +3 \end{bmatrix}$$



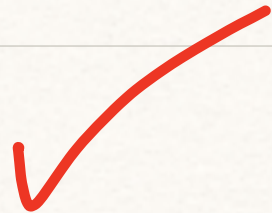
$$R_2(-1) \rightarrow R_2$$

$$\left[\begin{array}{ccc|c} 1 & 3 & 2 & 2 \\ 0 & 2 & 5 & -8 \\ 0 & -1 & -2 & 3 \end{array} \right]$$



$$R_2 + R_3 \rightarrow R_2$$

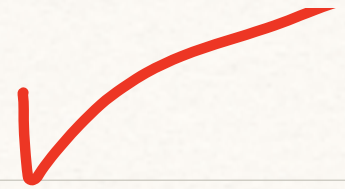
$$\left[\begin{array}{ccc|c} 1 & 3 & 2 & 2 \\ 0 & 1 & 3 & -5 \\ 0 & -1 & -2 & 3 \end{array} \right]$$



$$R_2 + R_3 \rightarrow R_3$$

$$\left[\begin{array}{ccc|c} 1 & 3 & 2 & 2 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 0 & 1 & 3 & -5 \\ 0 & 0 & 1 & -2 \\ \dots & \dots & \dots & \dots \end{array} \right]$$



$$R_3(-3) + R_2 \rightarrow R_2$$

$$\left[\begin{array}{ccc|c} 1 & 3 & 2 & 2 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & -2 \end{array} \right]$$



$$R_3(-2) + R_1 \rightarrow R_1$$

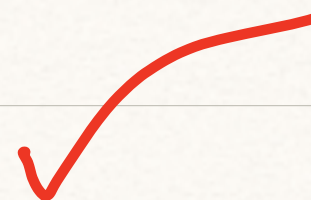
$$\left[\begin{array}{ccc|c} 1 & 3 & 2 & 2 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & -2 \end{array} \right]$$

$$\begin{bmatrix} 1 & 2 & 0 & | & 6 \\ 0 & 1 & 0 & | & 1 \\ 0 & 0 & 1 & | & -2 \end{bmatrix}$$



$$R_2(-3) + R_1 \rightarrow R_1$$

$$\begin{bmatrix} 1 & 0 & 0 & | & 3 \\ 0 & 1 & 0 & | & 1 \\ 0 & 0 & 1 & | & -2 \end{bmatrix}$$



$$\rightarrow x = +3$$

$y = 1$
 $z = -2$

The image shows two equations, $y = 1$ and $z = -2$, written in blue ink. To the left of each equation is a red arrow pointing towards the left. The entire set of equations is enclosed within a light blue, hand-drawn rectangular highlight.