الاسم هذا الخطوة باسم ساوي
وحله ثانية
مساوي

$$3X_1 - X_2 + 2X_3 = 12$$
$$X_1 + 2X_2 + 3X_3 = 11$$
$$2X_1 - 2X_2 - X_3 = 2$$

$$\begin{pmatrix} 3 & -1 & 2 \\ 1 & 2 & 3 \\ 2 & -2 & -1 \end{pmatrix} = \begin{pmatrix} 12 \\ 11 \\ 2 \end{pmatrix}$$

$$\left(\begin{array}{ccc|c} 3 & -1 & 2 & 12 \\ 1 & 2 & 3 & 11 \\ 2 & -2 & -1 & 2 \end{array}\right)$$

$$R_2 = R_2 - \frac{a_{21}}{a_{11}} R_1 = R_2 - \frac{1}{3} R_1$$

$$= 1 - \frac{1}{3} \times 3 = 0$$

$$= 2 - \frac{1}{3} \times -1 = \frac{7}{3}$$

$$= 3 - \frac{1}{3} \times 2 = \frac{7}{3}$$

$$= 11 - \frac{1}{3} \times 12 = 7$$

$$\left(\begin{array}{ccc|c} 3 & -1 & 2 & 12 \\ 0 & \frac{7}{3} & \frac{7}{3} & 7 \\ 2 & -2 & -1 & 2 \end{array}\right)$$

$$R_3 = R_3 - \frac{a_{31}}{a_{11}} R_1 = R_3 - \frac{2}{3} R_1$$

$$= 2 - \frac{2}{3} \times 3 = 0$$

$$= -2 - \frac{2}{3} \times -1 = \frac{-4}{3}$$

$$= -1 - \frac{2}{3} \times 2 = \frac{-7}{3}$$

$$= 2 - \frac{2}{3} \times 12 = \frac{-18}{2} = -6$$

$$\begin{pmatrix} 3 & -1 & 2 & : & 12 \\ 0 & \frac{7}{3} & \frac{7}{3} & : & 7 \\ 0 & \frac{-4}{3} & \frac{-7}{3} & : & -6 \end{pmatrix}$$

$$R_3 = R_3 - \frac{a_{32}}{a_{22}} R_2 = R_3 - \frac{\frac{-4}{3}}{\frac{7}{3}} R_2$$

$$R_3 + \frac{4}{7} R_2$$

$$= \frac{-4}{3} + \frac{4}{7} \times \frac{7}{3} = 0$$

$$= \frac{-7}{3} + \frac{4}{7} \times \frac{7}{3} = -1$$

$$= -6 + \frac{4}{7} \times 7 = -2$$

$$\begin{pmatrix} 0 & -1 & 2 & : & 12 \\ 0 & \frac{7}{3} & \frac{7}{3} & : & 7 \\ 0 & 0 & -1 & : & -2 \end{pmatrix}$$

$$-X_3 = -2$$

$$\boxed{X_3 = 2}$$

$$\frac{7}{3}X_2 = 7 - \frac{14}{3} = \frac{21 - 14}{3} = \frac{7}{3}$$

$$\left(\frac{7}{3}X_2 = \frac{7}{3}\right) \times \frac{3}{7}$$

$$\boxed{X_2 = 1}$$

$$3X_1 - X_2 + 2X_3 = 12$$
$$3X_1 - 1 + 2(2) = 12$$
$$3X_1 + 3 = 12$$
$$3X_1 = 12 - 3$$
$$3X_1 = 9 \div 9$$

$$\boxed{X_1 = 3}$$