$$\begin{bmatrix} 1 & 2 & 0 & 2 \\ 0 & 4 & -5 & 1 \\ 2 & 0 & 5 & 3 \end{bmatrix} \times -2R1 + R3 \to R3 \qquad \begin{matrix} -2 & -4 & 0 & -4 \\ 2 & 0 & 5 & 3 \\ 0 & -4 & 5 & -1 \end{matrix}$$

$$\downarrow$$

$$\begin{bmatrix} 1 & 2 & 0 & 2 \\ 0 & 4 & -5 & 1 \\ 0 & -4 & 5 & -1 \end{bmatrix} \times \tfrac{1}{4} R2 \to R2$$

$$\downarrow$$

$$\begin{bmatrix} 1 & 2 & 0 & 2 \\ 0 & 1 & -\frac{5}{4} & \frac{1}{4} \\ 0 & -4 & 5 & -1 \end{bmatrix} \times 4R2 + R3 \to R3 \qquad \begin{matrix} 0 & 4 & -5 & 1 \\ 0 & -4 & 5 & -1 \\ 0 & 0 & 0 & 0 \end{matrix}$$

$$\downarrow$$

$$\begin{bmatrix} 1 & 2 & 0 & 2 \\ 0 & 1 & -\frac{5}{4} & \frac{1}{4} \\ 0 & 0 & 0 & 0 \end{bmatrix} \times -2R2 + R1 \qquad \begin{matrix} 0 & -2 & +\frac{10}{4} & = \frac{2}{4} \\ 1 & 2 & 0 & 2 \\ 1 & 0 & \frac{10}{4} & \frac{3}{2} \end{matrix}$$

$$\downarrow$$

$$\begin{bmatrix} 1 & 0 & \frac{5}{2} & \frac{3}{2} \\ 0 & 1 & -\frac{5}{4} & \frac{1}{4} \\ 0 & 0 & 0 & 0 \end{bmatrix} \longrightarrow \begin{cases} x_1 = \frac{3}{2} - \frac{5}{2}x_3 \\ x_2 = \frac{1}{4} + \frac{5}{4}x_3 \\ x_3 \text{ is free} \end{cases}$$