(Q1) We first row-reduce normally:

$$\begin{pmatrix} 1 & 2 & -1 & 2 \\ 1 & 1 & 0 & 2 \\ 1 & 3 & -2 & 2 \end{pmatrix}$$
$$\downarrow R2 - R1$$
$$\begin{pmatrix} 1 & 2 & -1 & 2 \\ 0 & -1 & 1 & 0 \\ 1 & 3 & -2 & 2 \end{pmatrix}$$
$$\downarrow R3 - R1$$
$$\begin{pmatrix} 1 & 2 & -1 & 2 \\ 0 & -1 & 1 & 0 \\ 0 & 1 & -1 & 0 \end{pmatrix}$$
$$\downarrow R2 \cdot -1$$
$$\begin{pmatrix} 1 & 2 & -1 & 2 \\ 0 & 1 & -1 & 0 \\ 0 & 1 & -1 & 0 \end{pmatrix}$$
$$\downarrow R3 - R2$$
$$\begin{pmatrix} 1 & 2 & -1 & 2 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$
$$\downarrow R1 - 2R2$$
$$\begin{pmatrix} 1 & 0 & 2 & 2 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

We can then take each elementary matrix in reverse order of RREF operations and multiply them together to get the matrix

$$\begin{pmatrix} -1 & 2 & 0 \\ 1 & -1 & 0 \\ -2 & 1 & 0 \end{pmatrix}$$