DS13, Chap 9

$$A=\begin{pmatrix}1&1&1\\1&3&5\\1&5&3\\5&3&1\end{pmatrix}\xrightarrow{R_4^1(-5)}\begin{matrix}1&1&1\\1&3&5\\1&5&3\\0&-2&-4\end{matrix}$$

$$\xrightarrow{R_4^1(2)}\text{(wrong way)}\quad\begin{matrix}1&1&1\\1&3&5\\1&5&3\\2&0&-2\end{matrix}$$

$$\downarrow R_1^2(-1)\ \text{[This makes another 0 in the first column]}.$$

$$\begin{matrix}0&-2&-4\\1&3&5\\1&5&3\\0&2&-4\end{matrix}\xrightarrow{R_4^1(-1)}\begin{matrix}0&-2&-4\\1&3&5\\1&5&3\\0&0&0\end{matrix}$$

$$\xrightarrow{R_3^1}\begin{matrix}1&5&3\\1&3&5\\0&-2&-4\\0&0&0\end{matrix}\xrightarrow{R_2^1(-1)}\begin{matrix}1&5&3\\0&-2&2\\0&-2&-4\\0&0&0\end{matrix}$$

not possible to make them into zero

$$\xrightarrow{R_3^2(-1)}\begin{matrix}1&5&3\\0&-2&2\\0&0&-6\\0&0&0\end{matrix}\xrightarrow[R_2(-1/2)]{R_3(-1/6)}\begin{pmatrix}1&5&3\\0&1&-1\\0&0&1\\0&0&0\end{pmatrix}\quad\text{REF}$$

$$\downarrow R_1^2(-5)$$

$$\begin{pmatrix}1&0&8\\0&1&-1\\0&0&1\\0&0&0\end{pmatrix}\xrightarrow{R_1^3(-8)}\begin{matrix}1&0&0\\0&1&-1\\0&0&1\\0&0&0\end{matrix}\xrightarrow{R_2^3(1)}\begin{pmatrix}1&0&0\\0&1&0\\0&0&1\\0&0&0\end{pmatrix}$$

Finally, RREF!