Finding the Inverse of a Matrix by Gauss-Jordan Elimination

Let A be a square matrix of order n.

(1) Write the $n \times 2n$ matrix that consists of A on the left and the $n \times n$ identity matrix I on the right to obtain $\begin{bmatrix} A & I \end{bmatrix}$. This process is called **adjoining** matrix I to matrix A.

(2) If possible, row reduce A to I using elementary row operations on the entire matrix $\begin{bmatrix} A & I \end{bmatrix}$. The result will be the matrix $\begin{bmatrix} I & A^{-1} \end{bmatrix}$. If this is not possible, then A is noninvertible (or singular).

(3) Check your work by multiplying to see that $AA^{-1} = I = A^{-1}A$.