Step-1

(a) Suppose there is a system of three equations in three variables namely u, v, and w.

Suppose equation (3) started with zero coefficient.

That means equation (3) has only v and w terms.

But equation (1) has all the u, v, and w terms.

So, in this case, we are not needed to use any subtraction of a multiple of equation (1) from equation (3) to make it to the echelon form or triangular form to see the non singularity of the system.

Therefore, the given statement is true

Step-2

(b) While bringing a system in the matrix form to the echelon form, we use the coefficient of 1st variable of the 1st equation to make the coefficients of the 1st variable in the 2nd and 3rd equations zero.

Then we use the 2nd variable of the 2nd equation to make the 2nd variable of the 3rd equation zero.

Then we see an upper triangular form in the coefficient matrix part.

In view of this procedure, we can say that the given statement is $\boxed{\text{false}}$ as it is not necessary that even after making the 1st coefficient of the 3rd equation zero, the 2nd coefficient remains to be zero.

Step-3

(c) True

If the system is having three equations in three variables and the 3rd equation is with

$0u$ and $0v$, then it is already in the reduced form and so, we are not required to reduce further to check the non singularity of the system.