Assignment for Section 4.2: The nullspace of A

(1) Reduce
$$A = \begin{bmatrix} 1 & 2 & 2 & 4 & 6 \\ 1 & 2 & 3 & 6 & 9 \\ 0 & 0 & 1 & 2 & 3 \end{bmatrix}, \quad B = \begin{bmatrix} 2 & 4 & 2 \\ 0 & 4 & 4 \\ 0 & 8 & 8 \end{bmatrix}$$
to their triangular echelon forms U. Which variables are free?

(2) Construct a matrix whose column spaces contains $(1, 1, 5)$ and $(0, 3, 1)$, and its nullspaces contains $(1, 1, 2)$.

(3) Find the row reduced echelon form R for
$$A = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 3 \\ 2 & 4 & 6 \end{bmatrix},$$
and the row reduced echelon form R for the block matrix $B = [A\ A]$.