Additional Question for Homework on Section 4.1.

Problem A. Let $\vec{v}_1 = \begin{bmatrix} 1 \\ 3 \\ 0 \\ 4 \\ -1 \end{bmatrix}$, $\vec{v}_2 = \begin{bmatrix} 2 \\ 6 \\ 3 \\ 2 \\ -5 \end{bmatrix}$, and $\vec{v}_3 = \begin{bmatrix} -1 \\ -3 \\ 1 \\ -6 \\ 0 \end{bmatrix}$. Let $S = \text{span}\{\vec{v}_1, \vec{v}_2, \vec{v}_3\}$.

a) Find a basis for $S$. Find a basis for $S^\perp$. (If you plan correctly, you can find a basis for both while performing row reduction only once. Also there are two ways to accomplish this, one of which may be easier than the other.)

b) Express $S$ in normal vector form and in general form.