Exercises on solving $Ax = b$ and row reduced form $R$

**Problem 8.1:** (3.4 #13.(a,b,d) Introduction to Linear Algebra: Strang) Explain why these are all false:

a) The complete solution is any linear combination of $x_p$ and $x_n$.

b) The system $Ax = b$ has at most one particular solution.

c) If $A$ is invertible there is no solution $x_n$ in the nullspace.

**Problem 8.2:** (3.4 #28.) Let

$$U = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 0 & 4 \end{bmatrix} \text{ and } c = \begin{bmatrix} 5 \\ 8 \end{bmatrix}.$$  

Use Gauss-Jordan elimination to reduce the matrices $[U \ 0]$ and $[U \ c]$ to $[R \ 0]$ and $[R \ d]$. Solve $Rx = 0$ and $Rx = d$.

Check your work by plugging your values into the equations $Ul = 0$ and $Ul = c$.

**Problem 8.3:** (3.4 #36.) Suppose $Ax = b$ and $Cx = b$ have the same (complete) solutions for every $b$. Is it true that $A = C$?