Problem Set 2

Problem 1. *Let*

$$A = \begin{bmatrix} 1 & 2 & 1 & 0 & 0 \\ 1 & 2 & 2 & 2 & 3 \\ -1 & -2 & 0 & 2 & 3 \end{bmatrix}$$

(a) Find the complete solution to $Ax = 0$.

(b) Explain why $Ax = \begin{bmatrix} 2 \\ 2 \\ 3 \end{bmatrix}$ *is inconsistent.*

(c) Find the complete solution to $Ax = \begin{bmatrix} 1 \\ 2 \\ 0 \end{bmatrix}$.

Problem 2. ***True*** *or* ***False****. Give explanations or find counter examples.*

1. *If* x_p *is a particular solution to* $Ax = b$*, then* x_p *is in the nullspace of* A.
2. *Linear equation systems* $Ax = 0$ *always have a solution.*
3. *The column space and the nullspace of the* 5×3 *rectangular matrix* A *have the same dimension.*