Part II: True or False (30) Determine if each of the following statements is true or false. Each problem in this section is worth three points.

7. If $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \end{bmatrix}$, then A is invertible.

   A) True B) False

8. Any subspace of a vector space is also a vector space.

   A) True B) False

9. A subset H of a vector space V is a subspace if the following are satisfied: (i) the zero vector of V is in H (ii) H is closed under vector addition, (iii) there exists a scalar c such that $c\mathbf{u}$ is in H whenever $\mathbf{u}$ is in H.

   A) True B) False

10. If A is invertible, the $Nul(A) = Nul(A^{-1})$.

   A) True B) False

11. There is a basis for $\mathbb{R}^4$ that *includes* the vectors $\begin{bmatrix} 3 \\ 2 \\ 0 \\ 0 \end{bmatrix}$, $\begin{bmatrix} 1 \\ 1 \\ 3 \\ 0 \end{bmatrix}$, and $\begin{bmatrix} 1 \\ 3 \\ 4 \\ 5 \end{bmatrix}$

   A) True B) False