Math 324/524 Homework 9
YOUR NAME
Due 11/13/2019

1. Determine whether $S = \{t^3 + 1, 2t^3 + t, t^2 + 1, 2t^2 + 2t\}$ is a basis for P_3.

2. Find all subset of the set $S = \{(1, -2, 3), (-2, 3, 1), (2, 0, 1), (3, -1, 3)\}$ that form a basis for $\mathbb{R}^3$.

3. Find a basis for and the dimension of the subspace $W = \{(a, 4a, 3b - 2a) \ : \ a, b \in \mathbb{R}\}$ of $\mathbb{R}^3$.

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

(a) Find a basis for row(A), col(A), and $N(A)$.

(b) What are rank(A) and nullity(A)?

5. Let V be a vector space of dimension n. Prove that if W is a subspace of V then $\dim(W) \leq n$.

   Proof. Neat stuff □

6. Let A be an $m \times n$ matrix. Prove that if $\vec{x} \in N(A)$, then $\vec{x} \in N(A^T A)$ as well.

   Proof. The maths does the things. □