

NAME: _____

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M427J Quiz 5

Problem 1. [5 pts] Give a basis of \mathbb{R}^2 that includes the vector $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$. Explain why your answer is a basis.

Problem 2. [5 pts] Let V be the set of continuous functions $f : \mathbb{R} \rightarrow \mathbb{R}$ such that $\int_0^1 f(x) dx = 0$. Using the subspace lemma, show that V is a vector space.

Problem (Bonus). [2 pts] Do the previous problem again by giving a linear operator L such that $V = \ker L$. Make sure to specify the domain and codomain of L .