Quiz # 4 **Name:** ______________________
Date: 27/9/2022
Math 54: Fall 2022

Problem 1 - 2 Points

Consider the space $V = \mathbb{P}_2$, the polynomials with real coefficients of degree at most 2. Show whether the following subsets of V are subspaces of V.

1. $V_1 = \{a_0 + a_1x + a_2x^2, a_0, a_1, a_2 \text{ all odd}\}$
2. $V_2 = \{a_0 + a_1x + a_2x^2, a_0, a_1, a_2 \text{ all even}\}$

Problem 2 - 6 Points

True/False. Explain your answers.

1. If $B = \{\mathbf{v}_1, \mathbf{v}_2, ..., \mathbf{v}_n\}$ is a basis for $\mathbb{R}^n$ then the set $\{\mathbf{v}_1, ..., \mathbf{v}_n, \mathbf{u}\}$ must be linearly dependent for any vector $\mathbf{u}$.

2. If the columns of an $n \times n$ matrix A form a basis for $\mathbb{R}^n$ then A is invertible and the columns of A^{-1} also form a basis for $\mathbb{R}^n$.

3. If $B = \{f_1, ..., f_{n+1}\}$ is a basis for $\mathbb{P}_n$, the space of polynomials of degree at most n, then their derivatives $\{f_1', ..., f_{n+1}'\}$ also forms a basis of $\mathbb{P}_n$.

Problem 3 - 2 Points

Do one of the following:

1. Find the prime factors of 2149711.
2. Name a song you currently can't stop listening to.
3. Draw something interesting.