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

Name:

Solutions

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

1) Not subspace .
$$O \notin V_1 \approx O$$
 is not odd.
2) Not subspace . eng. $2+2x \in V_2$, not closed
 $\frac{1}{2}(2+2x) = l+x \notin V_2$ scalar multiply

Problem 2 - 6 Points

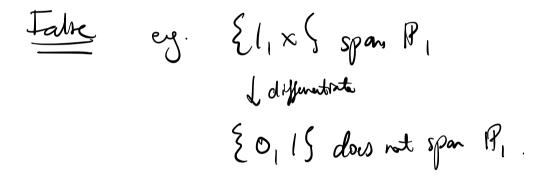
True/False. Explain your answers.

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 .

True A⁻¹ Inventikele, as
$$(A^{-1})^{-1} = A$$
,
so columns A^{-1} spon R^{n} and are likenly independent

If B = {f₁, ..., f_{n+1}} is a basis for P_n, the space of polynomials of degree at most n, then their derivatives {f'₁, ..., f'_{n+1}} also forms a basis of P_n.



Problem 3 - 2 Points

Do one of the following:

- 1. Find the prime factors of 2149711.
- ⁽⁷2) Name a song you currently can't stop listening to.

Fils de joie-Stromae

3. Draw something interesting.