

Math 205 Quiz 5

Name:

1. What are the three requirements for a subset H of a vector space V to be a subspace?

(a)

(b)

(c)

2. Given $B = \begin{bmatrix} 3 & 2 & 2 & 3 \\ 0 & -2 & 0 & 8 \\ 12 & 1 & 8 & 4 \end{bmatrix}$. Consider the following QUICK questions.

(a) Is $\vec{v} = \begin{pmatrix} -2 \\ 0 \\ 3 \\ 0 \end{pmatrix}$ in $\text{Nul}(B)$? Why or why not?

(b) Find a vector in $\text{Col}(B)$.

(c) Find a vector in $\text{Row}(B)$.

3. Find a basis of the $\text{Nul}(A)$ and $\text{Col}(A)$.

$$A = \begin{bmatrix} 1 & 2 & 5 \\ 1 & 2 & 1 \\ 2 & 0 & -5 \\ 3 & 1 & -1 \end{bmatrix} \text{ and } rref(A) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$$

4. Short Answer

(a) How many vectors are in a basis for \mathbb{R}^3 ?

(b) How many vectors are in a basis for \mathbb{P}_3 ?

(c) How many vectors are in a basis for $M_{3 \times 3}(\mathbb{R})$?