

Math 206 Group Quiz 1

Names: _____

1. Let $c \in \mathbb{R}$ be constant, A be an $m \times n$ matrix, and \mathbf{x} be a vector such that $A\mathbf{x} = c\mathbf{x}$. Why must $m = n$?

2. Show that if $\mathbf{v}_1, \mathbf{v}_2$ is linearly independent, then so is $\mathbf{v}_1, \mathbf{v}_1 + \mathbf{v}_2$.

3. “Linear combinations” and “span” can be defined for real valued functions (like $x^2 - 1$) in the same way they are defined for vectors in \mathbb{R}^n .

a. Describe all functions in the span of the functions 1 and x .

b. Describe all functions in the span of $1 + x$ and $1 - 2x$.

c. Describe all functions in the span of $1, x, x^2$.

d. Is the function e^x in the span of $1, x, x^2, x^3, \dots$? Why or why not?