

Part I (due Monday, March 4 at the beginning of class)

No Part I this time. Have a great break!

Part II (prepare for Monday, March 4)

Review the discussion of span on Daily Work 18 as needed to complete this question: Let $\vec{f} = \cos^2 x$ and $\vec{g} = \sin^2 x$. Which of the following lie in the space spanned by \vec{f} and \vec{g} ?

1. $\cos 2x$
2. $3 + x^2$
3. 1
4. $\sin x$
5. 0

Part III: Homework (due Wednesday, March 6 at the beginning of class)

1. For the given V and $W \subseteq V$, determine if W is a subspace of V . Prove your answer.
 - (a) $V = M_{n \times n}$, $W =$ the set of all $n \times n$ symmetric matrices
 - (b) $V = M_{2 \times 2}$, $W = \{A: AB = BA \text{ for some fixed } 2 \times 2 \text{ matrix } B\}$
 - (c) $V = P_3(x)$, $W =$ the set of all polynomials of the form $a_0 + a_1x + a_2x^2 + a_3x^3$ such that $a_0, a_1, a_2, a_3 \in \mathbb{Z}$
 - (d) $V = C[a, b]$, the set of all continuous functions on the interval $[a, b]$, $W = \left\{ f(x): \int_a^b f(x) = 0 \right\}$

Running list of vocabulary words that could be a quiz word

- linear equation
- system of linear equations
- linear combination of a set of vectors
- span of a set of vectors
- linearly independent
- linearly dependent
- reduced row echelon form
- pivot

- homogeneous system
- free variable
- row equivalent
- consistent system
- inconsistent system
- trace of a matrix
- transpose of a matrix
- inverse of a matrix
- elementary matrix
- transformation
- domain
- codomain
- range
- vector space (I will not ever ask you to define this on a quiz—the definition is way too long—but you should make sure you know what makes something a vector space)
- subspace