

MATH 201: LINEAR ALGEBRA
HOMEWORK DUE TUESDAY WEEK 3

Problem 1.

- (a) Prove that if two vectors are linearly dependent, then one of them must be a scalar multiple of the other.
- (b) Regarding \mathbb{C} as a vector space over \mathbb{C} , show that the vectors $1 + i$ and $1 - i$ are linearly dependent.
- (c) Find three vectors in \mathbb{R}^3 which are linearly dependent, and are such that any two of them are linearly independent.

Problem 2. Prove or give a counterexample.

- (a) If v_1, \dots, v_m are linearly independent and λ is a nonzero scalar, then $\lambda v_1, \dots, \lambda v_m$ are linearly independent.
- (b) If v_1, \dots, v_m and w_1, \dots, w_m are lists of linearly independent vectors, then $v_1 + w_1, \dots, v_m + w_m$ are linearly independent.