

21001, Section 01, Linear Algebra and applications  
HW 6, DUE Monday, March 14  
Instructor: Prof. Artem Zvavitch  
GOOD LUCK!!!

**Problem 1.** Write vector  $\mathbf{w} = (1, 1, 1)$  as a linear combination of vectors  $(1, 1, 2), (1, 1, 0), (1, 0, 2)$ .

**Problem 2.** Write polynomial  $x^2 + x + 1$  as a linear combination of polynomials  $x^2 + x + 2, x^2 + x, x^2 + 2$ .

**Problem 3.** Determine if the set of vectors

$$S = \{1 + x + x^2, 1 - x - x^2, 1 + 2x - 2x^2, x + x^2\}$$

is linearly dependent. If yes, then show that one of the vectors in this set can be written as a linear combination of the other three.

**Problem 4.** Show that set  $S = \{(0, 1, 2), (1, 1, 0), (1, 2, 2)\}$  DOES NOT span  $\mathbb{R}^3$ .