21001, Section 01, Linear Algebra and applications
HW 7, DUE Wednesday, April 6
Instructor: Prof. Artem Zvavitch
GOOD LUCK!!!

Problem 1. *Show that* $\{x^3+2, x^3-x-1, 3x^2+x, x^3+x-1\}$ *is a basis of* P_3.

Problem 2. *Determine the dimension of the following subspace of* $\mathbb{R}^4$

$$W = \{(a+b-c, a+2b+3c, a-b, c-b) : a, b, c \text{ are real numbers})\}$$

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.

Problem 4. *Please, find ANY NON standard basis of* $M_{2,2}$. *Do not forget to prove that the set of vectors you present is a basis!*