METU - NCC

LINEAR ALGEBRA SHORT EXAM 1	
Code : *MAT 260* Acad.Year : *2013-2014* Semester : *SPRING* Date : *27.03.2014* Time : *17:40* Duration : *40 min*	Last Name: Name : Student # : Signature : 3 QUESTIONS ON 2 PAGES TOTAL 100 POINTS

1. (10)	2. (10)	3. (10)					

1. *(10pts)* Let $E = \{(1,2,3),(1,1,-1)\}$. Show that E is linearly independent and find a basis of $\mathbb{R}^3$ which contains E (or extend it to a basis of $\mathbb{R}^3$), justify your answer.

2. *(10pts)* Let $S = \{a,b,c\}$. Show that

$$\mathcal{U} = \{f \in \mathbf{Fun}(S) : f(a) - f(b) + 2f(c) = 0\}$$

is a subspace of $\mathbf{Fun}(S)$. Find a basis of $\mathcal{U}$, justify your answer.

3. *(10pts)* Let W be the subspace of $\mathcal{P}_3(\mathbb{R})$ spanned by $E = \{x^3, x^3 - x^2, x^3 + x^2, x^3 - 1\}$. Find a linearly independent subset of E spanning W.