Math 208 Homework 9.

Problems from P.M. Fitzpatrick, Advanced Calculus.

Section 10.3, p.288: Problems: 1, 4, 9, 10,

Section 11.1, p.297: Problems: 5, 6, 9, 12
and the following problem:

Problem 1. Show that the the mapping $F : \mathbb{R}^n \to \mathbb{R}^n$ defind by

$$F(u) = \|u\|^2 u \tag{1}$$

is continuous and

$$(F(u) - F(v), u - v) \geq 0, \quad \forall u, v \in \mathbb{R}^n.$$

Problem 2. Show that the the mapping $F : \mathbb{R}^n \to \mathbb{R}^n$ defind by (1) satisfies the Lipschitz condition in each bounded set of $\mathbb{R}^n$.

Problem 3. Give an example of mapping $F : \mathbb{R}^n \to \mathbb{R}^n$ that is continuous on $\mathbb{R}^n$, but not Lipscitz continuous.