Problem Set 3

(1) Reading: Read Section 5.5 of Evans.

(2) Do problems 7, 8, 9, and 10 from section 5.10 of Evans.

(3) Show that there exists a bounded linear operator $E : W^{2,p}(\mathbb{R}^n_+) \to W^{2,p}(\mathbb{R}^n)$ such that

$$Eu = u \text{ on } \mathbb{R}^n_+$$

for all $u \in W^{2,p}(\mathbb{R}^n_+)$.

(4) Let $U \subset \mathbb{R}^n$ be bounded and open, with smooth boundary. Show that there exists a bounded linear operator $E : W^{2,p}(U) \to W^{2,p}(\mathbb{R}^n)$ such that

$$Eu = u \text{ on } U$$

for all $u \in W^{2,p}(U)$.