

Homework 10- Due Monday Nov. 22.

Do problems 4.1.5, 4.1.9, 4.1.10, 4.2.3 and 4.2.4 from Durrett, and the following

1. Let  $X$  and  $Y$  be independent exponential random variables. Determine  $\mathbb{E}[X^2|X + Y]$  and  $E[XY|X + Y]$ .
2. Let  $X_1, \dots, X_n$  be independent and identically distributed random variables with finite expectation. Determine  $\mathbb{E}[X_1|X_1 + \dots + X_n]$ .
3. Let  $X$  and  $Y$  be independent and identically distributed random variables. Let  $\Delta = 1_{X \leq Y}$  and  $Z = X \wedge Y$ . Determine  $\mathbb{E}(h(X, Y)|\Delta, Z)$  for any  $h$  such that  $\mathbb{E}[|h(X, Y)|] < \infty$ .