

## STA 200A: Homework 7

Note: Below the notation 3.T11 means Chapter 3, Theoretical Exercise 11. Similarly, the notation 4.P21 means Chapter 4, Problem 21.

1. 6.P15
2. 6.P20
3. 6.P22
4. 6.P44
5. 6.P48
6. 6.T25
7. Let  $X$  and  $Y$  have the joint density function

$$f(x, y) = k(x - y), \quad 0 \leq y \leq x \leq 1$$

and 0 elsewhere, where  $k > 0$  is a constant.

- (a) Sketch the region over which the density is positive and use it in determining limits of integration to answer the following questions.
- (b) Find  $k$ .
- (c) Find the marginal densities of  $X$  and  $Y$ .
- (d) Find the conditional densities of  $Y$  given  $X$  and  $X$  given  $Y$ .