Stat 134: Section 22

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Conceptual Review

a. How do we find $Var(Y)$ from the conditional distribution of $Y|X$?

b. How do we get $f_{Y|X}(y|x)$ from $f_X(x)$ and $f_{X,Y}(x,y)$?

Problem 1

Let Y have exponential distribution with mean 0.5. Let X be such that, conditional on $Y = y$, X has exponential distribution with mean y. Find:

a. $E(X)$;

b. $Var(X)$.

from Ex 6.rev.8 in Pitman?s Probability

Problem 2

Suppose that Y and Z are random variables with the following joint density:

$$f(y,z) = \begin{cases} k(z-y) & \text{for } 0 \le y \le z \le 2, \\ 0 & \text{otherwise} \end{cases}$$

for some constant k. Find:

a. the marginal distribution of Y;

b. $P(Z < \frac{2}{3} | Y = \frac{1}{2})$

Ex 6.3.7 in Pitman's Probability