Stat 134: Section 22

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Problem 1

Let X_1 be uniform (0, 1) independent of X_2, that is, uniform (0, 2). Find:

a. $P(X_1 + X_2 \leq 2)$

b. the density of $X_1 + X_2$

c. the cdf of $X_1 + X_2$

Ex 5.4.1 in Pitman's Probability

Problem 2

A computer job must pass through two queues before it is processed. Suppose the waiting time in the first queue is exponential with rate α, and the waiting time in he second queue is exponential with rate β, independent of the first.

a. Find the density of the total time the job spends waiting in the two queues.

b. Find the expected total waiting time in terms of α and β.

c. Find the SD of the total waiting time in terms of α and β.

Ex 5.4.3 in Pitman's Probability

Problem 3

Find the density of $Y = U/V$ for independent uniform (0,1) variables U and V. *Ex 5.4.10 in Pitman's Probability*

Hint: Use the CDF.

Problem 4

Find the density of $Z = X - Y$ for independent exponential (λ) variables X and Y. *Ex 5.4.13 in Pitman's Probability*

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