Stat 134: Section 17

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Conceptual Review

a. X, Y are jointly distributed on the region $\{(x, y) : 1 < x < y < 3\}$. True or false: X, Y could be independent.

Problem 1

Suppose X_1, X_2 are independent random variables with the same density function.

a. Evaluate $P(X_1 < X_2)$;

b. Continuing, suppose X_1, X_2, X_3 are independent random variables with the same density function. Evaluate $P(X_{i1} < X_{i2} < X_{i3})$ where (i_1, i_2, i_3) is a given permutation of (1,2,3).

Ex 5.2.18 in Pitman's Probability

Problem 2

Two points are picked independently and uniformly from the region inside a unit circle. Let R_1 and R_2 be the distances of these points from the center of the circle. Find $P(R_1 < R_2/2)$. Hint: To find the probability distribution of R, it is easier to consider the c.d.f.