

degenerate bivariate normal (X,X)

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- *From:* quebecstat <quebecstat@xxxxxxx>
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Let $X \sim \text{Normal}(0,1)$

Define the (degenerate) bivariate normal (X,X)

Let $S = \{(x,y) : y=x\}$

I would like to show that

$P((X,X) \text{ is in } S) = 1$

I am told to evaluate (for any point (a,a) in S)

$P(X = a - \epsilon, X = a - \epsilon)$ and

$P(X = a, X = a)$

and go from there.

I really have no idea how to proceed here because the cdf and pdf do not exist. I would much appreciate a hint.

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