Let $F(x) = \mathbb{P}(X \leq x)$ $X \sim N(0,1)$. ⑥.

and $G(x) = \mathbb{P}(\sup(\cancel{X,X}\, Y, Z) \leq x)$ $\binom{Y}{Z} \sim$ Joint Gaussian marginally $N(0,1)$

Then, claim for

$x < 1/2$ $f(x) > g(x)$.

Proof: $f(x) = \lim_{h \to 0} \frac{F(x+h) - F(x)}{h}$. small h ie ~~max~~ s.t. $x+h < 1/2$!

$= \frac{1}{h}\mathbb{P}(X \in (x, x+h)) \cancel{\geq \frac{1}{h}\mathbb{P}(\sup(Y,Z) \in (x,x+h))}$

$= \frac{1}{h}\mathbb{P}(Y \in (x, x+h))$

$\geq \frac{1}{h}\mathbb{P}(\max(Y,Z) \in (x, x+h))$

PHB