When applying Lem 4.2 in Thm 4.6

only need F_0 cts

X $F(x) = \mathbb{P}(X \le x)$ is cts.

then given ~~cts~~ h, s.t h is invertible with h^{-1} cts.

$H(x) = \mathbb{P}(h(X) \le x)$ is cts.

proof: suppose that $X_n \to X$.

then $\mathbb{P}(h(X) \le X_n) = H(X_n)$

$= \mathbb{P}(X \le h^{-1}(X_n)) = F(h^{-1}(X_n))$

$\to F(h^{-1}(x))$

$X_n \to X \Rightarrow h^{-1}(X_n) \to h^{-1}(x)$ $\quad$ //

$\Rightarrow \quad \mathbb{P}(X \le h^{-1}(x))$

since X is multivariate = (as $X = T(n)$ in notation)

$= \mathbb{P}(h(X) \le x)$

$h(X) \le x$

$\Leftrightarrow$ & $h(X) \in \{y : y \le x\}$.

$\Leftrightarrow X \in h^{-1}(\{y : y \le x\})$

$x \in A$

$\Leftrightarrow f(x) \in f(A)$