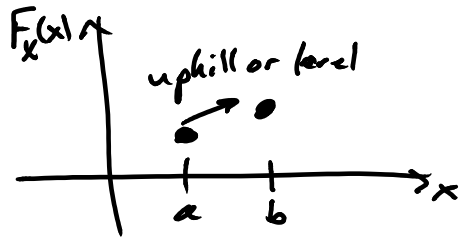


Why is the CDF nondecreasing i.e. increasing as we move from left to right along the x-axis??

In other words, if $a < b$, why is $F_X(a) \leq F_X(b)$??



$$F_X(a) = P(X \leq a) \\ = P(\{\omega \mid X(\omega) \leq a\})$$

$$F_X(b) = P(X \leq b) \\ = P(\{\omega \mid X(\omega) \leq b\})$$

$$F_X(a) = P(\{\omega \mid X(\omega) \leq a\}) \leq P(\{\omega \mid X(\omega) \leq b\}) = F_X(b)$$

↑ why? ↑
 If ω is in here then ω is in here too ↑
 i.e. this ↑ is a subset of ↑

e.g. if $\omega \rightarrow X=3.1$ and $3.1 \leq a$
 then $3.1 \leq b$ too
 Since $a < b$.