• FUNZIONE DI DISTRIBUZIONE DI VAR. ALEATORIA

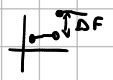
PROPRIETÀ:

1) F NON DECRESCENTE: SE $x \leq y \Rightarrow F(x) \leq F(y)$

2) $\lim_{x \to -\infty} F(x) = \lim_{x \to -\infty} P(X \leq x) = 0$
$\lim_{x \to +\infty} F(x) = \lim_{x \to +\infty} P(X \geq x) = 1$

3) $\lim_{x \to x_0^+} F(x) = F(x_0) \quad \forall x_0 \in \mathbb{R}$ CONTINUA DA DESTRA
$\exists \lim_{x \to x_0^-} F(x) \quad \forall x_0 \in \mathbb{R}$ (NON PER FORZA $= F(x_0)$)
CON LIMITE A SINISTRA

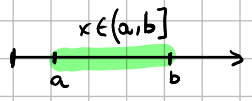
4) ΔF (DISLIVELLO IN UN PUNTO DI DISCONTINUITÀ a:)
↳ $F(a^+) - F(a^-) = P(a)$



$\Delta F(x) = \Delta F(x^+) - F(x^-) = P(x) \quad \forall x \in \mathbb{R}$

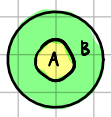
ES:

$P(a < X \leq b)$



$F(b) = P(X \leq b)$
$F(a) = P(X \leq a)$

$B = \{X \leq b\} \quad A = \{X \leq a\}$



$P(B/A) = P(B) - P(A)$
$P(a < X \leq b) = P(\{X \leq b\}, \quad = F(b) - F(a)$

• VARIABILI ALEATORIE ASSOLUTAMENTE CONTINUE:

$\int_{-\infty}^{+\infty} f(x)\,dx = 1$

f = FUNZIONE DI DENSITÀ DI PROBABILITÀ

$P(X \in (\alpha, \beta)) = \int_{\alpha}^{\beta} f(x)\,dx\,dx$

X CONTINUA e FISSANDO $x \in \mathbb{R} \quad P(X = x) = 0 \quad \left(\int_{\alpha}^{\alpha} f(x)\,dx = 0\right)$

FUNZIONE DI PROB.