Esercizio 9

domenica 23 maggio 2021 17:13

$$P(X = m - a) = \frac{1}{2}$$

$$P(X = m + a) = \frac{1}{2}$$

1

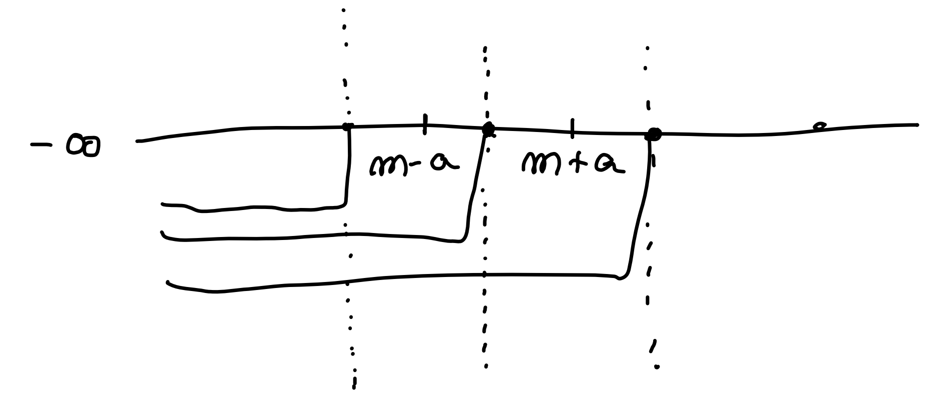
$F_X(x)$

$$F_X(x) = P(X \leq x) = P(\omega \in \Omega : X(\omega) \leq x) \quad \text{per } \forall x \in \mathbb{R}$$

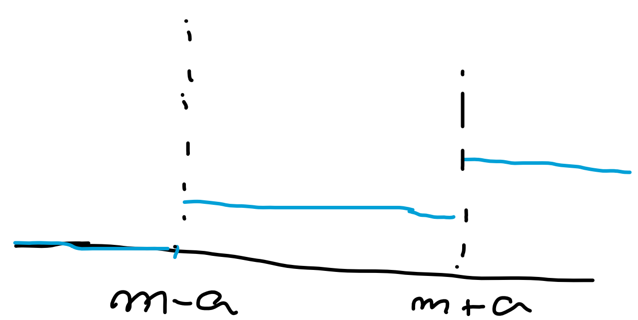
se $a > 0$
altrimenti
al contrario

$$\begin{cases} \emptyset & x < m - a \end{cases}$$

$$F_X(x) = \begin{cases} \emptyset & x < m-a \\ \frac{1}{2} & m-a \le x < m+a \\ 1 = \Omega & x \ge m+a \end{cases}$$



GRAFICO



③

MEDIA

$$E(X) = \sum_{p.\, x_p \in S} x_n \cdot p_X(x_n)$$

$$x_1\, p(x_1) + x_2 \cdot p(x_2) + x_3 \cdot p(x_3)$$

$$= (m-a) \cdot \frac{1}{2} + (m+a) \cdot \frac{1}{2}$$

$$= \frac{m-a}{2} + \frac{m+a}{2}$$

$$= \frac{\cancel{2}m + \cancel{a} - \cancel{a}}{\cancel{2}}$$

$$= m$$

VARIANZA

$$Var(X) = \sum_{i=1}^{k} (x_i - E(X))^2 \, p_i$$

oppure $$\sum_{i=1}^{k} x_i^2 \, p_i - E(X)^2$$

$$Var(X) = [(\cancel{m} - a) - \cancel{m}]^2 \cdot \frac{1}{2} + [(\cancel{m} + a) - \cancel{m}]^2 \cdot \frac{1}{2}$$

$$= a^2 \cdot \frac{1}{2} + a^2 \cdot \frac{1}{2}$$

$$= \frac{a^2}{2} + \frac{a^2}{2}$$

$$= \frac{\cancel{2}a^2}{\cancel{2}}$$

$$= a^2$$

Se $a = 0$

$$P(X = m - 0) = P(X = m) = \frac{1}{2}$$

$$P(X = m + 0) = P(X = m) = \frac{1}{2}$$

$$P(m) = \frac{1}{2} + \frac{1}{2} = 1$$